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# THE FREEING OF INTELLIGENCE*

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To those who earnestly believe that psychology may serve this generation in its struggle for democracy and world order, no task would appear more important than the wise integration of pure and applied psychology. That, then, will be my theme. Not that I wish to review the administrative phases of this enterprise, already so long and thoughtfully studied. Rather, I shall try to approach the problem with the concreteness which the shortness of time requires, by choosing one specific example of what a unified pure and applied psychology might achieve.

The problem to which I invite you to think with me is the maximum utilization by *homo sapiens* of those amazing cerebral hemispheres of his. He has wit enough to make for himself a happy sojourn on this planet and the gradual realization of more and more of his creative powers. He has wit enough to study, to understand and to control the predatory impulses of his kind, and to enrich and magnify the impulse to tenderness and good will. Yet he foams and frets, exhorts and moralizes. A visitor observing the Roman Empire, then joining the *Little Prince* among the minor planets, and returning in 1944, might note that intelligence, as the capacity to adapt the environment to one's needs, has been only very ambiguously advanced. He would wonder why man puts only half his mind into the discovery of the solutions he needs for his problem of community living, giving many of the critical decisions to the direction of blood rather than brains. Perhaps, he would conclude, brains are not *free* to act in accordance with their potential. Intelligence is fettered by manacles whose design has been imperfectly studied.

Scientific thought, as a full-fledged device for the analysis of nature, has been with us but three centuries. If the Lord asked some modern Job, "Canst thou bind the sweet influences of the Pleiades, or loose the bands of Orion?," he might well and modestly reply, "Not yet, but I have measured the distance and the magnitude of the Great Nebula in Andromeda and have weighed the invisible companion of Sirius." Indeed, wherever the task is objective and his intelligence free, he has

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remade the order of his world. Yet on points concerning his own nature, where his impulses have beclouded the process of his thinking, he still relies upon exhorting, moralizing, and argument. He has not, in fact, studied with any great perseverance the very process of thought itself, and is only dimly aware that the discrepancy between the achievement of science and the achievement of everyday thinking is due to failure to make clear the fetters which bind the thought processes. He has hardly heard Spinoza's precept: "be not angry, and complain not, but use reason." For how, otherwise, could a species producing the achievements of a Newton, a Darwin, or a Pasteur, prove incapable of ordering the relations of men in community, in nation, or in the world pattern of civilization? The towering genius of the great scientist often lapses into childish babblings as he turns to problems in which his personal desires give structure to his thought. When the will to believe, or the will to disbelieve, rather than to observe objectively and read the scroll of nature, is the guide, the sharpest tool of thought becomes suddenly dull, the greatest of creative impulses falls into the reiteration of petty prejudice.[1]

I would fully concede that simple economic fears, fears of the powers that be, can muddy the thinking of all men, including those classed as scientists; but I would urge a much more systematic and deep-probing study of the less obvious constraints which we unwittingly impose upon the freedom of our thought. Thought, we say, is loaded by individual personality trends, or we speak of autistic thinking. We know that the ordered process of thought exhibited in the textbooks differs substantially from the thinking which we ordinarily encounter; but as to the specific dynamics responsible for the difference, and about the manner of freeing ourselves from these impediments, we know little. For though the faculty psychology be honorably buried, the realm of intelligence still remains separated from the realm of impulse, feeling and motivation, not only in the pages of our textbooks but in most of our experimental studies. Though we dissect, measure, and factor-analyze man's intellectual powers, and pry ever deeper into his affective and impulsive life, yet even today, in an era of political bitterness and international frustration, where thinking is loaded with an unbearable freight of anxiety and unconscious distortion through wishes and fears, we have scarcely begun to lay bare and measure those impulsive dynamic relations which lie at the heart of thought.

We may trace for a moment the different paths which pure and applied psychology have followed in their study of the human capacity to think. Psychology discovered during the seventeenth and eighteenth centuries that the process of thought could be rather effectively reduced to associative laws wedded to an elementary mechanics of brain

processes. The tradition of Hartley and the tradition of Descartes were finally fused in a nineteenth-century associationism based upon sensory and motor elements arranged serially or in patterns. The problem of active or creative thought was solved by giving some elements in the associative stream a more central role than that assigned to others. The impulsive or emotional factors guiding thought were treated as secondary classes of elements arranged like the pieces of a mosaic pattern. Thought was basically an ordering of experiential items; and if at times the deeper dynamics of living appeared to confuse or distort the thought process, the distorting factors were made a subsidiary class of elements to be dealt with as a subordinate problem, in accordance with associative laws. The solution was, then, solidly intellectualistic.

Early in the present century, Gestalt psychology challenged the assumptions of associationism, turning to an emphasis upon the mind's structural properties. Intelligence was given a position of high importance, creative thought assigned a central role, because the mind was deemed capable of grasping with a single stroke the inherent order and beauty of natural objects in a natural order. But Gestalt psychology was still concerned, as association psychology had been, with the truth-seeking and truth-realizing aspects of such intellectual conquests. There was scant recognition that the mind is an evolutionary product in which the impulsive life gives quality and direction to the cognitive effort. Though many studies have been devoted by Gestalt psychologists to the nature of thought, such dynamic systems are conceived to arise directly from the structural properties of the external situation. While psychiatry on the one hand, anthropology on the other, have constantly stressed the bondage of thought to obscure, or even unconscious, directing tendencies, the implications for the experimental psychology of thinking appear still to be very incompletely realized.

*Applied psychology* has, on the other hand, been confronted throughout its existence with just those forms of thinking in business and industry, in clinic and in court, in school and in public opinion, which arise from a matrix of needs, and consequently provide major clues to the effective organization of the thought processes. Clinical psychology is intimately concerned with the distortion of the patient's world-view by affective factors in open or covert conflict with one another; while in the evaluation of the patient's intellectual resources the clinician observes the limits imposed upon the patient's intelligence by his need to see, to learn and to think in accordance with his drives, exhibiting a functional level of intelligence far removed from the measured capacity revealed by any test. Similarly, studies of industrial conflict have shown that injured egos and blind stubbornness can daily break the fine thread of understanding which practical self-interest and human reasonable-

ness have tenuously spun between management's and labor's viewpoints.

Here, then, as I shall try to show, is a supreme opportunity for an integrated psychology, dealing with the whole human being, to develop in a direction permitting the thought patterns of mankind in their natural setting to contribute to the understanding of the dynamics of thinking, while the psychologist of the laboratory, reaching to meet him, strives to integrate such findings within a single systematic effort.

## Autism

Let us attempt a more systematic statement of what we know today regarding the relation of our needs to our processes of thought, and of the directions in which research may prove fruitful, if intelligence is to be free to do its task.

We may conceive the brain as continuously receiving afferent impulses of exteroceptive, interoceptive, and proprioceptive types, ordered and integrated in individual life experience. The brain has no system of Wratten filters by which to operate on the basis of the external factors alone; as an evolutionary organ, its task is integrative, not dissociative.

This gives us Sherif's conception of perception as jointly determined by external and internal factors (**19**), an ordered result being achieved in which the personality disposition plays its part, in bi-polar fashion, jointly with the properties of the outer stimulating situation. Some of the interoceptive determiners are easily located by experiments showing that hungry subjects interpret neutral stimuli as food, while some of the proprioceptive determiners are suggested by experiments classified as studies of the influence of set or of attitude. Some of the most important factors appear to be inner tensions of considerable complexity, involving needs developed under social pressure. Thus, in one of Sherif's experiments in which a trained and an untrained observer worked together (**20**), it became clear that the insecurity of the untrained observer, the need to see as a trained observer did, was the chief dynamic factor involved.

The study of electroencephalography has added to the accumulating evidences that the cerebral cortex is in a continuous state of dynamic adjustment, exemplifying a continuous process of active adaptation to stimulation from the external environment and from inner activity. The percept, or the thought, develops as an organized response to a matrix of stimulation, in which the structure of the environment and the structure-giving tendencies of the perceiver converge in the determination of a unitary response. The external pattern is sometimes so rigidly structured that personal factors in *perception* may be minimized; but even here the personal factor is easily detected and measured when *recall* is tested, and it is more salient still in the case of *creative thought*

(2). As far as we know, there are no cognitive responses which are completely free from the control of motivation. To be sure, the tension system within the cortex may be less conspicuously dependent upon visceral conditions at one time than at another, and we must emphasize that in all the higher mammals there are many needs which are relatively independent of visceral conditions, depending apparently upon neuromuscular tension systems of a complex order. But this does not alter the fact that thinking is an active and directed process, in which needs determine both the point of origin and the direction of trend within the cognitive activity.

I will of course agree that cognitive processes are guided by habit, too; and I would stress under the term "habit" the naïve response to irrelevant cues or analogies. Piaget's studies (15), confirmed by Lerner (10), Dennis (5), and other workers, point to the great importance of primitive habit, especially thinking by analogy, a result confirmed in contemporary projective studies of childhood thinking. But I should follow Abel (1) in stressing that these same primitive thought patterns are found abundantly in normal adults. What James Harvey Robinson called the "history of the human mind" is largely the history of the transmission of socially sanctioned primitivisms. But I should be unwilling to admit that habit can be distinguished from motivated behavior; I would emphasize that habits become ingrained by *serving needs*, and that they die out, become extinguished, disintegrate, when the drive that underlies them fades away.

If we now set out to order the specific relations of cognition to the life of impulse, we might schematize the steps as follows:

First, at a sheer descriptive level, perception, recall, and thought tend to take a direction such as to bring to the individual a cognitive situation satisfying to his needs.

Second, this movement of cognitive processes in the direction of need-satisfaction is often unconsciously directed, the individual achieving a wish-fulfilling end by steps which do not betray to him the origin of the impulse which he follows. This appears to be simply because one of the needs is to keep himself happy regarding his own motivation. In the cases reported by psychoanalysis, the individual reaches his goal, remaining unaware that the pseudo-logical steps taken serve an unconscious need.

Third, that cognitive processes move towards need-satisfaction appears to be a special case of the law that *behavior in general* moves in the direction of need satisfaction. I refer here to the whole mass of data on the psychology of learning which, however phrased, define the customary elimination of the frustrating aspects and the fixation of the satisfying aspects of behavior processes.

Fourth, as to perceptual dynamics, it would appear that relatively unstructured perceptual situations are given structure in terms of *figure and ground*, by virtue of the fact that those elements stand out as figure which have previously been present as aspects of satisfying situations. The series of experiments from the Harvard Psychological Clinic (14) are, I think, convincing here. Thus personal needs serve to throw some elements of a visual or auditory pattern into the role of figure, so that one sees or hears what one needs to see or hear. This tendency is developed through learning; a designated aspect comes to serve as figure, if that aspect appears repeatedly in a satisfying situation. The Rorschach test similarly shows the tendency towards one or another perceptual habit, partly in terms of the sheer contents which are satisfying to particular observers, partly in terms of a deeper dynamics in which the impulsive or affective needs of the individual anchor upon one or another aspect of a relatively unstructured field. During the processes of perceptual shift and during the processes of recentering which occur in thought, the same process appears; from a complex of experience elements, those stand out which are aspects of a satisfying pattern, each phase being partially determined by the thinker's syndrome of needs. A little later I shall try to show how large a part is played in thought by those needs to which we usually refer under the term "curiosity" or the "exploratory drive." As a general principle it appears enough to say that thought, like perception, is bi-polar, the dynamics of figure and ground deriving jointly from the structural properties of the stimulus situation and from the need-patterns of the individual.

In view of this preliminary analysis, it should be clear that not only the wish but the fear may be father to the thought. In many learning situations, autism derived from fear may be repeated and fixated. The impulse to perceive the nature of the threat is activated by the need to escape; this appears to be a way of coping with threats developed through earlier experience with such threatening situations. In anxiety one may repeatedly recall that which has brought on the greatest distress.

Another suggestion, formulated and tested by Chein (11), is useful in explaining why the relation of drive to autism is not linear. For some hours after partaking of food, subjects showed more and more tendency to perceive food as they looked at indistinct colored and uncolored figures presented behind a ground-glass screen. But there came a time with every subject when, with increasing hunger, the trend was reversed and there was less and less tendency to perceive food. With the more realistic colored cards this trend set in earlier. Chein observed that the impulse toward reality which was temporarily weakened had begun to assert itself. After some hours of food deprivation, the impulse

to see food autistically becomes less effective in competition with the drive to face the whole reality, and to leave the situation in quest of actual food. Here, then, in Chein's remarks is a suggestion as to the quantitative study of the relative strengths of two drive-determined tendencies. This sort of quantitative analysis points to the temporal relations of particular types of autism; our aim might ultimately be the detection and quantitative study of the pattern of autistic trends within any individual perceiver. The first problem today, however, would appear to be the discovery of the specific conditions which give rise to fear autisms on the one hand, wish autisms on the other.

We have emphasized that autistic responses are learned responses. Since these steps in perceptual development are like the steps in motor learning, we shall perhaps ultimately find that the dynamics of autistic cognition are the same as the dynamics of the motor learning processes, that the perceptual world is conditioned and molded as is the behavior world. If research reaches such a point, it would make applicable to the psychology of thought everything we know about the psychology of learning. Whether this would support a motor theory of consciousness, I do not know. But it would seem likely that perception, and the cognitive life in general, arises from the same type of genetic dispositions, is moulded in the same way by the learning process, and eventuates in a form governed by the same ultimate laws as motor behavior.

It may be objected that all such studies have to do with thought encumbered by complications, that despite such complications, the bare, primordial form of intellect remains as a matrix or substrate. There is conceived to lie, beyond all these deviations, pure intellect *qua* intellect. Now indeed if pure intellect is to be found, we should go to the ends of the earth to find it. Pure intellect, free of all personal autistic deviations, would be the pearl of great price, the discovery of which would constitute a master stroke not only for psychology but for civilization. Where, then, is this pure intellect, this Faustian homunculus, this little gem of rationality to which we strive to gain access in our experiments in the psychology of thought and in our metrical analysis of intellectual functions? Possible approaches to its discovery might appear to lie in rigidly controlled laboratory research; but here we have found that cultural and personal variables have consistently affected not only the amount but the very structure of the process of thinking. Or we might seek it in early childhood; but here thought occurs as an aspect of a type of global effortful contact with the world in which the non-rational and the egocentric mark the process and the product. Or we might seek it in the works of pure genius; but here the biographer and the historian have consistently pointed to the impress of personality upon even the most logical ordering of scientific relationships. There is, we sadly conclude,

no such pearl of great price, no intellect which stands apart from the concrete personal, drive-directed efforts at contact with reality. There is no "pure" intelligence at all.

When one looks at the process of thinking in this way, seeing the impress of personal tensions and the resulting personal ways of thinking at every phase in the development of the mind, many of the formal problems relating to intellect take on a very different appearance. An example is provided by our bitter struggle over the nature-nurture question as it relates to intelligence quotients. Intellect has been conceived on the one hand to lie dormant as a potential within the germ cell, waiting only to be nursed into expression. It has, on the other hand, been conceived to be the impress of a system of social arrangements mediated to the growing individual. Studies undertaking to evaluate the relative contributions of variance in nature and nurture have yielded the ambiguous results likely to characterize statistical treatments when theory proceeds in confusion or from contrasting frames of reference. Some clarification has come from the many hints that the influence of superior environment may lie partly in the qualitative and quantitative transformation of abilities as a result of the arousal of the child's interests, the development of tastes, and the specific forms taken by the "will to learn"; the drive structure of the child gives direction and expression to his measurable intellectual powers. As Sears (**18**) has put it, "Within rather wide limits the essential factor determining whether the subject's motivational (affective and attitudinal) peculiarities will cause significant deviations of psychometric performance seems to be what the test situation means, consciously or unconsciously, in terms of this particular subject's individual patterning of complexes and desires." In the light of such observations, it appears likely that in relation to intellectual tasks there are two levels at which personality variables may operate: (1) they may give structure to that which reaches consciousness; (2) they may, through fear, completely prevent the mind from making contact with certain specific stimulus materials. Inhibition or blockage, as in the case of reading disabilities and in the case of data of the type reported by Sears, may appear when there is a profound emotional incapacity to give the mind to the material at all. Conversely, we should expect that a positive love of certain stimulus materials would give a better-than-average opportunity for close attention to it, with a likelihood of achieving greater "resolving power" in relation to it. Autism, the movement of cognitive processes in the direction of need-satisfaction, involves, then, both the figure-ground patterning of given situations and also the crippling or the enhancement of mental functions in accordance with conscious or unconscious drive-patterns.

The comment has cautiously come that perhaps the influence of

motivation in directing the processes of thought may play a part in the differential rates of growth among the different *kinds* of intellectual capacities, the mind being progressively sensitized to specific aspects of the environment which take on meaning for the individual. Perhaps when the data permit us to understand the qualitative changes wrought in intellectual functions by various kinds of influences, and to measure their amounts, we might go on to ask about their gross aggregate in the form of intelligence quotients. We can hardly expect to understand mentality as a whole until its specific expressions have been accurately observed and measured in the growing individual.

### Socially Shared Autisms

I have not meant to imply that autistic responses necessarily separate a man from his fellows. On the contrary, it is characteristic of every social group to develop its own socially shared autisms. There are very clear, consistent, and well-organized pictures of Christian Scientists in the minds of good Roman Catholics, and of Mormons in the minds of good Presbyterians. These pictures have been built up through a great deal of consistent social sharing. They are far indeed from personal autisms. They are, on the whole, more refractory to evidence than are the personal autisms. They do not, however, permit commitment of their possessors to institutions, since none would remain outside; the very collectivity of the autistic frames is regarded as evidence of individual sanity. By and large, more cognitive distortion is achieved through socially shared autisms than through psychotic processes within the individual. By a mechanism which Stefansson (22) has described in the brilliant phrase "the standardization of error," it is possible for human beings to achieve an amazing clarity of viewpoint which springs not from contact with reality but from the need for protection from surprises and ego injuries. And in accordance with Sherif's suggestion that the more unstructured the perceptual field given by a situation, the greater the role of autistic elements, the danger of destructive autisms is peculiarly great in relation to matters of social living. The world of social immediacy—frequently the world of the unstructured, the confused, the rapidly changing, the world of uncertain norms and of value conflict—is a world in which autism reigns supreme.

Unfortunately we ourselves have no immunity from this principle. The socially shared autisms of Americans constitute an example of the sort of thing with which our peace-makers might well be concerned. No casual study of international relations will make clear to an Englishman, a Russian or a Chinese why we are so certain regarding the essential infallibility of our institutions. We may show much tolerance and say many fine things about our allies, but the glasses through which we

look as members of an indoctrinated group are something to which we can never really be intimately introduced; for our defenses are too good. We are only today groping towards techniques by which the common autisms of conflicting or cooperating groups may be fully explored and measured.

And though we may smile at the autisms of the layman, social psychology, in company with all the social sciences, suffers acutely from autisms. Thus it is not merely the lack of precision-measures which makes the social sciences fall short of the mark as full-fledged sciences. Thought works here with relatively unstructured material; it is likely to reflect the autisms of the specialist. The possible contribution of social psychology to human life can hardly be discussed without recognizing the two-fold difficulty which besets us. For while obstacles stand in our way with regard to controlling this external structure, we are neglecting the more immediate obstacles, namely the autisms of individual social scientists, including social psychologists.

Could social psychology and its kindred social sciences discover a framework in which perceptual realities could be ordered with less autism, we might discover that it is not simply the complexity of the task which makes an acceptable world order so hard to organize. It is doubtful whether world order is really more complicated than the wavicle theory of light, or more difficult to achieve than the reduction of gravitation and electro-magnetism to a common formula. The hard thing is to get a group of social scientists to mobilize their intellectual powers on the basis of problems as such. How much easier it is, like Luther, to nail our precious beliefs to the door as something to defend.

But it is not simply social psychology, it is all psychology which is autistically structured. In a rationalistic era the psychologist believed that he had only to look with reason's eye upon the processes which determined his own conclusions. Later one might marvel at the furious controversies among early German experimental psychologists, but conclude that on certain issues some one was maliciously distorting the facts. The associationist could scarcely recognize that the whole effort of psychology springs from dynamic grounds, as do all other efforts, and that wish-fulfilling factors have been involved in the choice of problems, in the setting up of methods, in the evaluation of results. As long as it can, psychology has kept the blinders on with reference to issues which do not fit the cultural temper.

American psychology has developed upon this base a peculiarly rich, subtle, brittle, and dogmatic outlook as to nature and as to human beings and how their minds work. As members of the western cultural group, we are not only out of touch with oriental psychology, but doubt whether the experience of those unfamiliar with western science has any-

thing important to offer. When Behanan (3) offered us his little book on Yoga, we accepted it as a tribute to the fabulous East. But how many American laboratories found his sober account of oriental practice useful in comparison with Jacobson's (9) and Max's (13) studies of muscle tensions and their relation to ideation? Moreover, the different psychologies which have arisen in the various countries of the western world differ not so much by way of contradiction as by way of imposing upon the data different types of figure-ground organization; and the provincialism of American psychology prior to the 1930's has been reduced not so much by boldness in asking what psychologists of other lands have discovered as by the fact that the European situation disgorged upon our shores a number of psychologists with such power and eloquence as simply to command our attention despite our hesitation. Our own autisms, both positive and negative, have been responsible largely for the historical shape which psychology has taken. To move fast in an era which needs us so much will require a merciless searching of the autisms of today.

Similar to the history of the conflict of warfare between science and religion is the history of the struggle to resist new thought forms which new inquiries into nature have created. When Mesmer came to Paris he presented two problems for a scientific answer, the nature of his cures, and the question of animal magnetism. The scientists of the day seized upon the problem of magnetism, and disposed of it. They were not, however, sensitized to the psychological problem of the cures, and did little with it. The long struggle of Elliotson to get the phenomena of hypnosis under scientific observation led to the same result; the problem of magnetism was handled with dispatch, while the problem of the cures, not fitting into the frame of reference, was evaded. When, finally, James Braid made the classical mistake of concluding that hypnosis was largely due to specific muscular fatigue, and thus found a way of phrasing hypnotic phenomena so that they would not disturb the serenity of medical men, the mistake had its share in leading to the acceptance of hypnosis as fact. Braid later showed that muscular fatigue did not explain the results; but in the midst of his positive contributions he had committed the kind of error required to make the phenomena assimilable to the prejudices of existing science, and the trick was done.

If I may permit myself a small prophecy, I would venture that the many independent experiments upon paranormal psychological processes now going on in Britain (e.g., 4, 6, 21) and America (e.g., 12, 16, 17) under the rigid experimental and statistical controls which are today properly demanded, cannot be assimilated, nor even noted, by American psychology until some generous soul, in the manner of Braid, phrases a theory which integrates the results with the existing psychological

frame of reference. The new theory will probably be an amiable error, as was Braid's, but when once the profession has begun to study and to repeat the experiments, the theory, like an afterbirth, can quietly shrivel away.

The physicists have discovered a superior way of handling unassimilable ideas, "outrageous hypotheses." They have learned since Faraday's time, as every year brings discoveries which just don't fit into classical physics, to invent mathematical descriptions which simply denote what the evidence reveals, treating events of the older physics as one special class of events comfortably housed within the vast mansions of the new. The local autisms of the physicist have in large measure been washed away by a stream of mathematical symbols. In fact, most physicists do not seem interested in defending any final world view. In the open spaces of mathematical invention there is no such constraint. And the odd thing is that this kind of free thinking pays the hugest dividends which any scientific effort has ever yielded.

## Curiosity

If one accepts the broad conception that thought, like everything else in life, reflects the dynamics of motivation, there is likely to arise a word of despair, concluding that if this be so, there is no truth, there is no science, there is only the realization of satisfactions. Yet this, I think, is a naïve conception of human nature and indeed of animal nature generally. For it is because thought makes contact with reality that it has appeared in the course of evolution. Sense organs may not mediate the *ultimate* reality, whatever that may be, but they do mediate the first reality with which adjustment is made. Paraphrasing what Marx said to the idealists, "We do not know what reality is, but we can adapt it to our needs." There is truth, and there is science, as exemplified by physics and by medicine, which are not only immediately useful but which surely suggest that we are more in touch with reality than we were three centuries ago. For the sense organs and the brain are developed as a reality-mediating system of tools; and the bi-polar organization of perception is always anchored partly upon the structure of an external world with which we must deal.

But there is an additional factor guaranteeing the integrity of the scientific enterprise. There is not only a good system of receptors; there is also a powerful positive motivation to make contact with reality; this motivation is frequently more powerful than any personal drive which might lead to escape from such adaptation. For creatures like ourselves it is necessary to keep sense organs and brain in contact with the world, constantly varying the perceptual pattern just as we constantly vary the motor adjustments, making sure of the utmost use of

the tools of observation by which each pattern is constantly checked against other information. This is a way of saying that the curiosity impulse is one of the most powerful, one of the most difficult to assuage, that man possesses. It is characteristic of primates to explore about rather than to stop to digest the convenient banana; and it is characteristic of boy and girl to pry into matters to see what makes them tick. I suspect, following Holt (**8**), that curiosity probably arises from such primordial tendencies as perseveration and the circular response. But whatever its origins, the impulse increases with the development of intellect. And this impulsion may lead to the structuring of socially verifiable and socially shared experience, for example in the form of the sciences.

As Wertheimer so earnestly insisted, it is the nature of man to lean hard upon the external structure-giving aspects of reality. He *needs* contact with reality even more than he needs escape from it. He can develop such a craving for contact with reality as will sweep away personal autisms and the smug sense of cultural rightness. If this analysis be sound, the curiosity motive would apparently serve, as other drives do, to determine the figure-ground relationships of perceptual patterns. Curiosity would throw some aspects of the stimulus into relief. The curious mind constantly sees new figure-ground possibilities, and this is why, as a probe of reality, it far surpasses the petty limitations of ordinary autism.

Immediately we ask: what aspects of a pattern yield the *true* figure? May not the same pattern of phenomena lend itself to different types of structuring? Yes; a composite phenomenon presented to people with varying types of curiosity will lead them in varying directions. Different cultures, and different individuals, dealing with the same perennial phenomena, have made sense of them in different ways. The cooperative venture of science serves in some measure to integrate the individual curiosities of individual scientists.

But curiosity in this sense is not only general. It is also specific. The small child shows not only the will to know, but the will to know some things rather than others, the bending of the mind in this way rather than that. These variations in curiosity share in the determination of intellectual limits to be achieved by the individual in the different fields of its application, just as the cultivation of intellect consists largely of the cultivation of the thirst for contact with reality. The individual's personality determines, together with his inherited wit, how far he may go. There is no easily definable limit to the depth to which the individual may immerse himself in material which he loves, no limit to the power of the mind to saturate itself with that which satisfies it. This is no plea against the recognition of constitutional inadequacies, and no

plea against the biological improvement of the human stock. Rather, beginning with whatever the stock permits, it is a plea for recognition that not only accidentally acquired tastes, but the mind as a whole is moulded by that with which it makes contact; for every sensitization of the creative life is quite literally a gain in intelligence.

Now such curiosity is highly contagious, and civilization has been built largely by socially transmitted demands for specific kinds of understanding. Modern students of the Greek City State stand amazed at the profundity reached by the run of leisure-time inquirers, who sought from their teachers the answer to ultimate philosophical questions. Crude though their science was, limited as was their awareness of the place of man in Nature, they had an amazing capacity to perceive and attack problems of great subtlety and complexity. Just as the mind of the artist was moulded by a Phidias, the mind of the dramatist by a Sophocles, the mind of the young philosopher was moulded by a Protagoras or a Socrates.

This fine whetting of the intellectual blade is a socially continuous process, not simply an individual achievement. In the same fashion, the student of experimental science goes today to a laboratory where a great tradition has been established, that his mind may take on the mould of those who have built the tradition, just as the ambitious violinist goes to study with those who stand in direct descent from the great Paganini. In this sense the dynamic mould of intellectual function is the precious achievement of each cultural group, not simply a distortion imposed by cultural limitations; and the moulding of the mind in the direction of impelling objectivity and insatiable curiosity into the ways of Nature is one of the most priceless gifts which modern society can give its children. What we need chiefly to fear is that such curiosity may be narrowly limited to specific subject matter, when the mind during the formative period has known the delights of free inquiry only within one domain. The generalization of curiosity is, however, just as practicable as is the generalization of any other attitude, provided it be not left to chance, but systematically encouraged. The struggle of the mind to keep itself free from every sort of bondage, to remain curious, open, unsatiated in all its relations with Nature, is ten-fold more difficult than the cultivation of a stable, satisfying point of view, but a thousand-fold more precious.

## Relaxation

Thus far, I have praised the active life of curiosity, and have not hesitated to speak of the *struggle* for contact with reality. But there is another approach. We of the West are prone to forget that water quietly freezing can burst a granite that no sledge hammer can crack.

There are latent creative powers which wait to move forward to their work when freed from the restless downward pressures of the alert mind; creative powers which spring into being when once the narrow, nervous, preoccupied world of waking activity steps aside in favor of a quiet integration of all that one has experienced; when one is willing to let the mind leave harbor and travel fearlessly over an ocean of new experience. Under profound relaxation there are some impulsions which wield a benevolent despotism over thought which the whip of concentrated attention cannot control; thinking is still motivated, but motivated with less immediacy in relation to the tasks of the surrounding world. The historical record of creative thought and the laboratory report of its appearance today are equally clear that creative intelligence can spring from the mind which is not strained to its highest pitch, but is utterly at ease.

Indeed, as Hollingworth (7) showed us twenty years ago, the finer instruments in intellectual analysis are better understood when their counterparts are discovered in the humble occurrences of the dream. His conception of a system of cues redintegrating old patterns, or predisposing towards one rather than another new pattern, has facilitated the application of all the resources of association psychology to the study of thought. Particularly important was his insistence upon the world of reverie as possessing a richness and a complexity in the light of which the ordered processes of realistic thought become simply a special case.

On one point, I think we may today go further than Hollingworth. We have begun to realize that it is characteristic of fantasy to be more *creative* than is logical thought, in the sense that more cues are woven into the composite texture determined by many needs; in the same way the dreams of the night, starting from a complexity of individual determinants, achieve not simply a bizarre but in many respects a highly creative end-result. There is a tendency to overlook the real implications of the psychology of the dream, particularly if one is concerned solely with the therapeutic problem of the unconscious wishes portrayed in the individual case. More important for psychology as a science is the creative character of the dream itself, realizing, as in Coleridge's *Kubla Khan,* a power and an intensity to which waking fantasy is usually alien. This is not because the dream revealed fewer of Coleridge's interests or needs; rather, because more of them were free to pool their energies, to integrate their contributions. The dream gives us, as in a natural laboratory, a device for introducing more personal variables and consequently a richer permutation of end results. It would follow that a more systematic experimental study of the dream might give us a wider view of its creative potentialities, oriented to more aspects of reality than waking life can afford to recognize.

One aspect of our practical Americanism, our surviving frontiersmen's psychology, with its emphasis on wide-awake alertness and with a touch of Calvinistic devotion to immediate duty, is a suspicion of all these mental states which seem, according to the standard, not to "get us anywhere"; a general disvaluation of the relaxed, the casual, and the exploratory. The dreamer awakes from an extraordinarily vivid, realistic, intriguing dream, an experience which, if encountered in a novel or a play, he would cherish as a new avenue to the meaning of life. "A funny dream," he yawns, and by the time he has his nose in the morning newspaper he has forgotten it. To disvalue the dream is to prove oneself a sensible man.

One state is perhaps still more important, because it can be better controlled, namely the hypnotic state, in which there has recently been a marked increase in interest. The great utility of hypnosis lies, I believe, in discovering that imaginative richness, that creative power, that capacity to knock down and reassemble the ingredients of life which constitutes independent, unconventional, non-routinized, original thought. The hypnotic thought may indeed be trivial if the individual experimenter so expects. But because we live under a profound cultural disvaluation of all mental states but that of rapt alertness, the fact that we have here a markedly less constrained and more creative type of intellect has infrequently attracted our attention. Perhaps the experimental use of hypnosis may lay bare the impediments, the blind spots, the personal autisms which encumber the intellectual powers of the subject, may lead to a more focussed integration of the associative resources which lie in the background of his mind. Robert White and his collaborators (23) have made this point with surpassing skill. In summarizing experimental evidence that subjects under hypnosis remembered meaningful material much better than they could when awake, they remark: "Relaxation itself, nevertheless, has something to do with the betterment of recall. Most people are accustomed to regard alert, volitionally sustained attention as the best of all possible mental states, so that they are surprised to think that the mind sometimes works better when left a little to itself."

I believe, then, in summary, that there is evidence that functional intelligence can be enormously enhanced, first by the systematic study and removal of individual and socially shared autisms, second, by the cultivation of curiosity, and third, by the art of withdrawal from the pressures of immediate external tasks, to let the mind work at its own pace and in its own congenial way.

There are probably other important principles which I have overlooked. But the time is favorable for a thorough study, by every means and through every approach, of the processes by which intelligence

works, to the end that its potential be no longer stifled and frustrated, but utterly liberated. Perhaps the major contribution which psychology can make to this generation is to show how intelligence may be freed of the incubus which sits upon its chest, and to enable a free intellect to cut through the hideous confusion of today.

### The Need for Help from Applied Psychology

I have attempted in this hour to give one example of a problem in which academic psychologists have dire need of help from their colleagues in all the applied fields, a problem in which we can expect only limping progress as long as we remain apart.

It is the universal experience of clinical psychologists, of industrial psychologists, and of public opinion analysts that the thought processes of their clients or subjects are loaded with the personal autisms of daily living. It is not thought of an Aristotelian type, but thought as a tension-reducing mechanism that appears in domestic conflict and in political controversy. Tragically, the storehouse of material here obtainable, though daily written up or discussed in conference, remains to this day almost completely opaque to the pencil of light which laboratory studies of the thought process may introduce, while laboratory psychologists must often look pitifully about to find controversial questions which may be mimeographed and presented to students in the hope of getting something real enough, hot enough, to evoke the flaming outline of a true autism. Perhaps this is because the experimental psychologists were in the first place taught that science was concerned only with those things which happened in a quasi-impersonal situation. As Mark May suggested, laboratory subjects were requested to "park their culture outside." Our predicament is like that of some unhappy geologist who, though trained in the chemistry of rocks and in the physics of erosion, might in the badlands of South Dakota despair at the prodigality with which nature has thrown about her sandstones, in evident unconcern for the precision approach which it would be so convenient to use. It is assumed among geologists that laboratory and field observations are integral, not independent aspects of their effort. For the most part, however, the field observer in psychology suffers from a sense of remoteness from laboratory inquiry, as well as from a limitation of prestige. For him field inquiries lack the dignity of science; and unless he can improvise the methods himself, he is unlikely to see how to integrate them in a scientific procedure.

There remains the danger that within the new structure of psychology the various divisions will maintain their separate abodes, like the many independent apartments within the "long house" of the Iroquois Indian, or of the Manhattan Islander, instead of constituting the

various aspects of one substantial mansion, all rooms of which contribute to the adequate housing of a unified scientific enterprise. The danger is that the psychology of thought remain in one room, protected by the aegis of experimental and theoretical psychology, that the psychology of autism as observed in public opinion polls be kept in chaste isolation in another room, that the vagaries of human thinking as they occur in clinical practice serve as museum pieces in a third apartment. The actual unity of the human thought process would be lost. Only that type of unification of pure and applied psychology which would fractionate the *administrative* tasks to be performed, but not the organic unity of the human being, would serve to the advancement of psychology. That type of fractionation which would cleave and sunder the human being into pure and applied functions, or pure and applied areas of activity, could easily prove retrogressive. If the clinical or business psychologist or the public-opinion investigator can discover problems of broad and profound significance, these must be presented where people with laboratory facilities can see and understand them; and if the laboratory psychologist discovers new principles which he believes should have social usefulness, he needs an audience sympathetically attuned to such a presentation.

This has implications as regards the programs which may be set up by the new divisions. But it has deeper implications, relating to the training of psychologists. For if psychologists in training conceive themselves to be laboratory psychologists, clinical psychologists, or public-opinion analysts, they have already built up a picture of themselves, an ego structure which will make certain types of psychological findings unassimilable to them. The time for them to obtain a vision of psychology as one great inclusive discipline, and to get a complete work-out and opportunity to grow mature both in the laboratory and in field experience with human problems, is the time of their first youthful assault upon psychology. Let us hope that their curiosity into human nature will be so unbounded, and so free, that despite later specialization they will always remain genuinely curious about everything that human nature has to offer.

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# PSYCHOLOGISTS' PREFERENCES FOR DIVISIONS UNDER THE PROPOSED APA BY-LAWS

ERNEST R. HILGARD

A ballot prepared by the Joint Constitutional Committee of the American Psychological Association and the American Association for Applied Psychology was mailed through the facilities of the Office of Psychological Personnel to all American psychologists, regardless of society affiliation, early in 1944. The ballot, entitled *Survey of Opinion on the By-Laws Proposed for a Reorganized American Psychological Association* consisted of three sections, the first devoted to the divisional organization, the second reporting the present affiliation of the respondent, and the third calling for general comments, criticisms and suggestions on the proposed by-laws.* This report is concerned with the preferences indicated for divisions.

It is appropriate that these divisional preferences be re-examined at this time, because, by action of the two societies at their meetings in September 1944, the Joint Constitutional Committee is charged with proposing to the membership suggested modifications of the divisional structure which appeared in the edition of the by-laws prepared in June 1944 and adopted at the September meetings. It was the sense of the meeting that the number of divisions be reduced through combining those showing the greatest amount of overlap. The material presented here will be used by the committee in its further deliberations.

The divisional preferences are of considerable interest apart from their relationship to the organizational problems of the psychological associations, since they reveal a good deal about the psychologist's picture of himself in relation to his profession. Because most of those who replied checked a number of divisions, it is possible to determine significant interest clusters. The relative frequency of choices indicates trends within the profession.

Instructions relative to the checking of divisional preferences were as follows:

> Indicate by a *single check* all the divisions you might wish to join if such divisions were established, and by a *double check* the division of your primary choice. Write the names of possible additional divisions in the blank spaces and check in the same way.

There followed the following 19 divisions, and three additional blank spaces:

1. Division of Abnormal Psychology
2. Division of Animal (Comparative) Psychology
3. Division of Business Psychology

* A copy of the ballot is to be found in the *Psychological Bulletin*, 1943, 40, 646 f.

4. Division of Child (Developmental) Psychology (incl. Adolescence)
5. Division of Clinical Psychology
6. Division of Consulting Psychology
7. Division of Educational Psychology
8. Division of General Psychology*
9. Division of Industrial Psychology
10. Division of Measurements and Statistics
11. Division of Military Psychology
12. Division of Personnel Psychology
13. Division of Physiological Psychology
14. Division of Public Service
15. Division of Social Psychology
16. Division on the Teaching of Psychology
17. Division of Theoretical, Systematic and Historical Psychology
18. Society for the Psychological Study of Social Issues (if a Division of the APA)
19. Psychometric Society (if a Division of the APA)

The names as they appeared on the ballot are reproduced here, because the wording of the titles undoubtedly influenced choices in some cases. In the tables which follow, divisions are identified by the adjective used in alphabetizing them, in the case of the first 17 divisions, and by society initials or abbreviated names in the case of the last two.

Some 6,000 ballots were mailed out. These went to many persons not affiliated with the major societies, whose names were obtained from the Roster of Scientific and Professional Personnel and other sources. The 3,680 usable ballots returned represent the preferences of a substantial proportion of active psychologists. Membership in the American Psychological Association in 1944 totalled 3,806; the American Association for Applied Psychology included but 80 more who did not belong to the APA. A summary of ballots returned is presented in Table I.

TABLE I

TOTAL VOTES TALLIED

| | Number | Per cent |
|---|---|---|
| Ballots with single primary choices among listed divisions | 2677 | 73 |
| Ballots with write-in divisions as primary choices | 114 | 3 |
| Ballots with multiple primary choices | 365 | 10 |
| Ballots without primary choice (single checks only) | 524 | 14 |
| Total completed returns | 3680* | 100 |

* There were in addition 75 ballots returned without votes for divisions. These were chiefly from respondents who did not consider themselves eligible to vote, but a few were returned blank by those disapproving of the reorganization.

* Attention was called to the provision of the proposed by-laws which stated: "Members of the Association not expressing a preference for any special division, shall be members of a Division of General Psychology." This definition of the division as a division-at-large affected the number of preferences expressed for it.

A general summary of divisional preferences is given in Table II. That the center of gravity of interest of psychologists has shifted toward

TABLE II

SUMMARY OF PRIMARY AND OTHER CHOICES FOR DIVISIONS

| Proposed Divisions | Primary Choices (double-checked) | | | Secondary Choices (single-checked) | Total Choices | Per cent of 3680 |
|---|---|---|---|---|---|---|
| | Single Choice | One of Multiple Choice | Total | | | |
| 1. Abnormal | 112 | 54 | 166 | 1,314 | 1,480 | 40 |
| 2. Animal | 35 | 6 | 41 | 304 | 345 | 9 |
| 3. Business | 22 | 23 | 45 | 529 | 574 | 16 |
| 4. Child | 227 | 84 | 311 | 1,308 | 1,619 | 44 |
| 5. Clinical | 618 | 150 | 768 | 1,183 | 1,951 | 53 |
| 6. Consulting | 152 | 94 | 246 | 1,166 | 1,412 | 38 |
| 7. Educational | 210 | 73 | 283 | 1,029 | 1,312 | 36 |
| 8. General | 212 | 33 | 245 | 632 | 877 | 24 |
| 9. Industrial | 136 | 56 | 192 | 771 | 963 | 26 |
| 10. Measurement | 104 | 48 | 152 | 959 | 1,111 | 30 |
| 11. Military | 36 | 32 | 68 | 825 | 893 | 24 |
| 12. Personnel | 316 | 101 | 417 | 1,316 | 1,733 | 47 |
| 13. Physiological | 125 | 20 | 145 | 393 | 538 | 15 |
| 14. Public Service | 17 | 11 | 28 | 297 | 325 | 9 |
| 15. Social | 104 | 55 | 159 | 888 | 1,047 | 28 |
| 16. Teaching | 71 | 41 | 112 | 791 | 903 | 25 |
| 17. Theoretical | 73 | 23 | 96 | 497 | 593 | 16 |
| 18. SPSSI | 61 | 40 | 101 | 784 | 885 | 24 |
| 19. Psychometric Soc. | 46 | 24 | 70 | 590 | 660 | 18 |
| 20. Other (specified) | 114 | 38 | 152 | 243 | 395 | 11 |
| Total choices by 3,680 respondents | 2,791 | 1,006 | 3,797 | 15,819 | 19,616 | |

applied fields is evident in the three choices which lead both in expressed primary preferences and in secondary preferences: clinical, personnel, and child. Apart from general psychology, which has a somewhat ambiguous meaning in this context, the several divisions next in order of primary preference are educational, consulting, and industrial. Physiological psychology follows these. That psychologists do not think of themselves as animal psychologists or as comparative psychologists in any considerable numbers is shown by the rating of animal psychology as 17th among the 19 named divisions in primary choices, and 18th in secondary choices.

When a stated list such as this one is presented for vote, unnamed divisions are at a distinct disadvantage, even though encouragement is given for writing in the names of additional divisions. Relatively few of those replying (about 10%) took advantage of the opportunity for writing in other divisions, and only 114 of 3,680 (3%) double-checked the written-in division as their one primary choice. That several divi-

sions even under these circumstances received an appreciable number of votes means that they would have received a much larger number had they been written on the ballot. The most frequently mentioned additional divisions are listed in Table III. The replies have been coded

TABLE III

PREFERENCES EXPRESSED FOR DIVISIONS NOT NAMED ON THE BALLOT

| Divisions Written-In | Primary Choices (double-checked) | | | Secondary Choices (single-checked) | Total Choices |
|---|---|---|---|---|---|
| | Single Choice | One of Multiple Choice | Total | | |
| Experimental | 30 | 5 | 35 | 31 | 66 |
| Personality | 15 | 4 | 19 | 15 | 34 |
| Learning | 9 | 0 | 9 | 11 | 20 |
| Vocational Guidance | 9 | 5 | 14 | 15 | 29 |
| Esthetics | 8 | 4 | 12 | 18 | 30 |
| Medical | 6 | 1 | 7 | 9 | 16 |
| School | 5 | 0 | 5 | 0 | 5 |
| Religious | 4 | 2 | 6 | 14 | 20 |
| Genetic | 4 | 1 | 5 | 17 | 22 |
| Crime; Delinquency | 3 | 1 | 4 | 11 | 15 |
| Mental Hygiene | 3 | 2 | 5 | 15 | 20 |
| Others | 18* | 13 | 31 | 87 | 118 |
| Total Choices | 114 | 38 | 152 | 243 | 395 |

* Not more than 2 preferences for any one additional division.

so that slight verbal differences were ignored in grouping the votes. Perception and psychophysics were included under experimental psychology; psychoanalysis was included under medical psychology. Esthetics includes all mentions of art, music, and literature. Educational guidance was in some cases mentioned with vocational guidance, and they are not separately tabulated.

The main interests not provided for in the list of named divisions as derived from the additional suggestions are those of general experimental psychology, personality in its general rather than clinical meaning, and esthetics. The other special interests are distinctive, but are in all cases closely related to proposed divisions.

In any attempt to simplify the divisional structure through the combining of divisions, it is important to know the overlap among divisional preferences. Therefore the replies have been classified according to the division of primary preference, and all other choices tabulated. The results are given in Table IV, in terms of the absolute number of votes. The last column of this table gives the number of divisions mentioned per reply, for each of the primary choices.

The data of Table IV have been expressed as percentages in Table V.

## TABLE IV

ALL CHOICES CLASSIFIED ACCORDING TO DIVISION OF PRIMARY CHOICE: NUMBER OF VOTES

| Proposed Divisions: Primary Choices | Total Returns Classified According to Primary Choice | Other Divisions Checked by Those with Stated Primary Choice | | | | | | | | | | | | | | | | | | | | Number of Divisions Mentioned per Reply |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1. Abnormal | 2. Animal | 3. Business | 4. Child | 5. Clinical | 6. Consulting | 7. Educational | 8. General | 9. Industrial | 10. Measurement | 11. Military | 12. Personnel | 13. Physiological | 14. Public Service | 15. Social | 16. Teaching | 17. Theoretical | 18. SPSSI | 19. Psychometric Soc. | 20. Other | |
| 1. Abnormal | 112 | | 13 | 11 | 47 | 86 | 48 | 16 | 23 | 18 | 15 | 15 | 35 | 30 | 7 | 41 | 33 | 25 | 27 | 16 | 13 | 5.6 |
| 2. Animal | 35 | 13 | | 1 | 10 | 7 | 2 | 6 | 13 | 8 | 7 | 6 | 5 | 21 | 3 | 11 | 10 | 16 | 13 | 4 | 3 | 5.3 |
| 3. Business | 22 | 4 | 0 | | 1 | 0 | 9 | 3 | 1 | 21 | 6 | 3 | 17 | 0 | 2 | 4 | 1 | 0 | 4 | 2 | 0 | 4.5 |
| 4. Child | 227 | 60 | 8 | 8 | | 142 | 75 | 110 | 26 | 20 | 54 | 9 | 62 | 12 | 12 | 64 | 47 | 20 | 54 | 29 | 9 | 4.6 |
| 5. Clinical | 618 | 388 | 13 | 28 | 388 | | 350 | 217 | 56 | 77 | 141 | 75 | 236 | 44 | 38 | 121 | 117 | 49 | 130 | 130 | 33 | 5.3 |
| 6. Consulting | 152 | 82 | 2 | 22 | 75 | 111 | | 51 | 12 | 40 | 24 | 33 | 85 | 13 | 14 | 35 | 34 | 10 | 36 | 16 | 9 | 5.6 |
| 7. Educational | 210 | 42 | 2 | 12 | 126 | 68 | 51 | | 40 | 18 | 89 | 25 | 92 | 6 | 12 | 43 | 77 | 13 | 34 | 23 | 4 | 4.7 |
| 8. General | 212 | 78 | 38 | 20 | 61 | 55 | 34 | 38 | | 46 | 46 | 21 | 66 | 55 | 12 | 66 | 61 | 76 | 41 | 23 | 22 | 5.1 |
| 9. Industrial | 136 | 27 | 4 | 82 | 16 | 41 | 54 | 15 | 11 | | 60 | 24 | 117 | 10 | 13 | 16 | 8 | 7 | 23 | 28 | 7 | 5.1 |
| 10. Measurement | 104 | 11 | 6 | 17 | 23 | 29 | 19 | 50 | 18 | 28 | | 19 | 53 | 4 | 10 | 24 | 17 | 15 | 23 | 70 | 5 | 5.2 |
| 11. Military | 36 | 16 | 1 | 12 | 7 | 19 | 12 | 7 | 2 | 18 | 10 | | 28 | 6 | 5 | 7 | 3 | 5 | 4 | 7 | 2 | 5.8 |
| 12. Personnel | 316 | 65 | 7 | 119 | 56 | 113 | 117 | 97 | 38 | 195 | 114 | 80 | | 11 | 43 | 69 | 51 | 21 | 53 | 40 | 13 | 5.1 |
| 13. Physiological | 125 | 40 | 60 | 3 | 23 | 30 | 9 | 8 | 32 | 17 | 24 | 21 | 14 | | 3 | 10 | 22 | 28 | 12 | 12 | 11 | 4.0 |
| 14. Public Service | 17 | 3 | 1 | 4 | 3 | 11 | 6 | 2 | 1 | 7 | 4 | 5 | 12 | 1 | | 5 | 2 | 1 | 6 | 3 | 0 | 5.5 |
| 15. Social | 104 | 32 | 11 | 11 | 37 | 30 | 24 | 19 | 30 | 20 | 24 | 10 | 31 | 12 | 11 | | 30 | 30 | 70 | 10 | 7 | 5.3 |
| 16. Teaching | 71 | 35 | 6 | 9 | 33 | 29 | 22 | 36 | 23 | 16 | 23 | 14 | 33 | 14 | 4 | 21 | | 10 | 17 | 9 | 4 | 6.0 |
| 17. Theoretical | 73 | 34 | 21 | 7 | 21 | 25 | 9 | 13 | 29 | 6 | 12 | 5 | 9 | 15 | 1 | 28 | 20 | | 26 | 7 | 14 | 5.1 |
| 18. SPSSI | 61 | 20 | 2 | 7 | 25 | 19 | 14 | 15 | 9 | 12 | 13 | 7 | 24 | 3 | 16 | 50 | 5 | 15 | | 10 | 7 | 5.5 |
| 19. Psychometric Soc. | 46 | 4 | 0 | 6 | 6 | 7 | 7 | 16 | 8 | 13 | 40 | 6 | 18 | 1 | 2 | 4 | 4 | 2 | 4 | | 4 | 4.3 |
| 20. Others (specified) | 114 | 36 | 24 | 7 | 33 | 48 | 25 | 18 | 34 | 13 | 19 | 12 | 28 | 24 | 4 | 28 | 27 | 36 | 26 | 8 | 10 | 5.0 |
| Total, Single Primary Choices | 2791 | 990 | 219 | 386 | 991 | 870 | 887 | 737 | 406 | 593 | 725 | 390 | 965 | 282 | 212 | 647 | 569 | 379 | 603 | 447 | 177 | 5.1 |
| Multiple Primary Choices | 365 | 193 | 34 | 87 | 201 | 238 | 196 | 180 | 107 | 117 | 142 | 86 | 222 | 56 | 57 | 154 | 137 | 61 | 113 | 81 | 60 | 6.1 |
| No Primary Choice | 524 | 185 | 57 | 79 | 200 | 225 | 177 | 185 | 152 | 117 | 140 | 81 | 230 | 75 | 39 | 142 | 126 | 80 | 108 | 86 | 44 | 4.8 |
| Total Returns and Choices | 3680 | 1368 | 310 | 552 | 1392 | 1333 | 1260 | 1102 | 665 | 827 | 1007 | 557 | 1417 | 413 | 308 | 943 | 832 | 520 | 824 | 614 | 281 | 5.3 |

TABLE V

## TABLE V

ALL CHOICES CLASSIFIED ACCORDING TO DIVISION OF PRIMARY CHOICE: PER CENTS

| Proposed Divisions: Primary Choices | Total Returns Classified According to Primary Choice[a] | | Other Divisions Checked Expressed as a Per cent of Those With Stated Primary Choice | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | Per cent | 1. Abnormal | 2. Animal | 3. Business | 4. Child | 5. Clinical | 6. Consulting | 7. Educational | 8. General | 9. Industrial | 10. Measurement | 11. Military | 12. Personnel | 13. Physiological | 14. Public Service | 15. Social | 16. Teaching | 17. Theoretical | 18. SPSSI | 19. Psychometric Soc. | 20. Other[b] |
| 1. Abnormal | 112 | 100 | | 12 | 10 | 42 | 77 | 43 | 14 | 21 | 16 | 13 | 13 | 31 | 27 | 6 | 37 | 29 | 22 | 24 | 14 | 12 |
| 2. Animal | 35 | 100 | 37 | | 3 | 29 | 20 | 6 | 17 | 37 | 23 | 20 | 17 | 14 | 60 | 9 | 31 | 29 | 46 | 37 | 11 | 9 |
| 3. Business | 22 | 100 | 18 | 0 | | 5 | 0 | 41 | 14 | 5 | 95 | 27 | 14 | 77 | 0 | 9 | 18 | 5 | 0 | 18 | 9 | 0 |
| 4. Child | 227 | 100 | 26 | 4 | 4 | | 63 | 33 | 48 | 11 | 9 | 24 | 4 | 27 | 5 | 5 | 28 | 21 | 9 | 24 | 13 | 4 |
| 5. Clinical | 618 | 100 | 63 | 2 | 5 | 63 | | 57 | 35 | 9 | 12 | 23 | 12 | 38 | 7 | 6 | 20 | 19 | 8 | 21 | 21 | 5 |
| 6. Consulting | 152 | 100 | 54 | 1 | 14 | 49 | 73 | | 34 | 8 | 26 | 16 | 22 | 56 | 9 | 9 | 23 | 22 | 7 | 24 | 11 | 6 |
| 7. Educational | 210 | 100 | 20 | 1 | 6 | 60 | 32 | 24 | | 19 | 9 | 42 | 12 | 44 | 3 | 6 | 20 | 37 | 6 | 16 | 11 | 2 |
| 8. General | 212 | 100 | 37 | 18 | 9 | 29 | 26 | 16 | 18 | | 22 | 22 | 10 | 31 | 26 | 7 | 31 | 29 | 36 | 19 | 11 | 10 |
| 9. Industrial | 136 | 100 | 20 | 3 | 60 | 12 | 30 | 40 | 11 | 8 | | 44 | 18 | 86 | 7 | 10 | 12 | 6 | 5 | 17 | 21 | 5 |
| 10. Measurement | 104 | 100 | 11 | 6 | 16 | 22 | 28 | 18 | 48 | 17 | 27 | | 18 | 51 | 4 | 10 | 23 | 16 | 14 | 22 | 67 | 5 |
| 11. Military | 36 | 100 | 44 | 3 | 33 | 19 | 53 | 33 | 19 | 6 | 50 | 28 | | 78 | 17 | 14 | 19 | 8 | 14 | 11 | 19 | 6 |
| 12. Personnel | 316 | 100 | 21 | 2 | 38 | 18 | 36 | 37 | 31 | 12 | 62 | 36 | 25 | | 3 | 14 | 22 | 16 | 7 | 17 | 13 | 4 |
| 13. Physiological | 125 | 100 | 32 | 48 | 2 | 18 | 24 | 7 | 6 | 26 | 14 | 19 | 17 | 11 | | 2 | 8 | 18 | 22 | 10 | 10 | 9 |
| 14. Public Service | 17 | 100 | 18 | 6 | 24 | 18 | 65 | 35 | 12 | 6 | 41 | 24 | 30 | 71 | 6 | | 30 | 12 | 6 | 35 | 18 | 0 |
| 15. Social | 104 | 100 | 31 | 11 | 11 | 36 | 29 | 23 | 18 | 29 | 19 | 23 | 10 | 30 | 12 | 11 | | 29 | 29 | 67 | 10 | 7 |
| 16. Teaching | 71 | 100 | 49 | 8 | 13 | 46 | 41 | 31 | 51 | 32 | 23 | 32 | 20 | 46 | 20 | 6 | 30 | | 14 | 24 | 13 | 6 |
| 17. Theoretical | 73 | 100 | 47 | 29 | 10 | 29 | 34 | 12 | 18 | 40 | 8 | 16 | 7 | 12 | 21 | 1 | 38 | 27 | | 36 | 10 | 19 |
| 18. SPSSI | 61 | 100 | 33 | 3 | 11 | 41 | 31 | 23 | 25 | 15 | 20 | 21 | 11 | 39 | 5 | 26 | 82 | 8 | 25 | | 16 | 11 |
| 19. Psychometric Soc. | 46 | 100 | 9 | 0 | 13 | 13 | 15 | 15 | 35 | 17 | 28 | 87 | 13 | 39 | 2 | 4 | 9 | 9 | 4 | 9 | | 9 |
| 20. Others (specified) | 114 | 100 | 31 | 21 | 6 | 29 | 42 | 22 | 16 | 30 | 11 | 17 | 11 | 25 | 21 | 4 | 25 | 24 | 32 | 23 | 7 | 9 |
| **Total, Single Primary Choices** | 2791 | 100 | 35 | 8 | 14 | 36 | 31 | 32 | 26 | 15 | 21 | 26 | 14 | 35 | 10 | 8 | 23 | 20 | 14 | 22 | 16 | 6 |
| **Multiple Primary Choices[c]** | 365 | 100 | 53 | 9 | 23 | 55 | 65 | 54 | 49 | 29 | 32 | 39 | 24 | 61 | 15 | 16 | 42 | 38 | 17 | 31 | 22 | 16 |
| **No Primary Choice[d]** | 524 | 100 | 35 | 11 | 15 | 38 | 43 | 34 | 35 | 29 | 22 | 27 | 15 | 44 | 14 | 7 | 27 | 24 | 15 | 21 | 16 | 8 |
| **Total Returns and Choices** | 3680 | 100 | 37 | 8 | 15 | 38 | 36 | 34 | 30 | 18 | 22 | 27 | 15 | 39 | 11 | 8 | 26 | 23 | 14 | 22 | 17 | 8 |
| **Chances in 100 that division will be checked by those whose single primary choice is another division** | | | 37 | 8 | 14 | 39 | 40 | 34 | 29 | 16 | 22 | 27 | 14 | 39 | 11 | 8 | 24 | 21 | 14 | 22 | 16 | 7 |

[a] The division of primary choice was double-checked on the ballot; other divisions chosen were single-checked, except as indicated.
[b] Other divisions written on the ballot. All mentions counted.
[c] If more than one division double-checked, all divisions checked (whether single or double) were entered in this row.
[d] Single-checks only.

In this table the secondary choices are expressed as a per cent of those with a given primary choice. This mode of presentation makes possible an interpretation by inspection of those divisional choices which lead to secondary choices different from the population as a whole.

Tables IV and V show the wide spread of secondary choices for all primary choices, with an average of something over 5 divisions being checked per reply. Some clusters of interest are evident, such as abnormal-clinical-consulting, business-industrial-personnel, measurement-Psychometric Society, social-SPSSI. Some logically overlapping interests do not in fact overlap, such as animal and child psychology.

The manner in which Table V can be used may be illustrated by animal and child psychology. From the table, the following assertions are possible:

4% of those whose primary preference was child also checked animal, which is less than the
8% of all those whose primary preference was other than animal who checked animal

Similarly,

29% of those whose primary preference was animal also checked child, which is less than the
39% of all those whose primary preference was other than child who checked child.

These results mean that the overlap between child and animal is less, on the average, than the overlap between either of these divisions and other listed divisions. This is an empirical argument against their combination.

By making use of the absolute numbers found in Table IV, it is possible to test the interrelationships of several divisions at once. For example, of the 882 whose primary choices were abnormal, clinical, or consulting, 815 or 92% checked clinical, 582 or 66% checked abnormal, and 550 or 62% checked consulting. It is evident that a grouping of these together as clinical would recognize the largest number of the group with a common preference.

Tabulations by society membership have not been made for the whole sample, but the ballots have been preserved, and supplementary analyses are possible. It is expected that the ballots will prove useful to the Division Organization Committee in obtaining lists of those interested in divisions but not represented by existing organized groups.

# IMPROVEMENT IN ELEMENTARY PSYCHOLOGY AS RELATED TO INTELLIGENCE*

H. B. CARLSON, R. P. FISCHER, AND P. T. YOUNG
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This study of improvement in elementary psychology as it is related to intelligence is an outgrowth of an attempt to devise a fair test of proficiency in elementary psychology and to set a reasonable standard for passing the test. The need for such a test arose when the University of Illinois established the policy of giving proficiency examinations each semester, similar to the regular semester examinations, in courses normally open to freshmen and sophomores. These examinations are considered to give sufficient evidence of mastery of a subject when a student gets a grade of at least *C* on the examination; this grade is recorded as *pass*, and it enables the student to go ahead with more advanced courses.

Most of the students who apply for proficiency examinations wish to accelerate their educational process through independent self-study. Occasionally a student applies for a proficiency examination when he has already completed a course in educational psychology or an introductory psychology course in some institution not accredited for college work by the University of Illinois.

Students frequently seek advice regarding preparation for a proficiency examination. To answer these inquiries we have prepared a mimeographed sheet which contains this statement:

> Proficiency examinations in psychology are not based upon any single textbook or group of books, but upon the established facts and principles of psychology which may be found in standard texts. If a student wishes to prepare for a proficiency examination through independent study, it is recommended that he make use of several standard textbooks rather than a single book. Following is a list of standard textbooks and books for supplementary reading:

Then follows a list of six standard textbooks of psychology (latest editions). These are the texts by: Boring, Langfeld, and Weld; Cole; Dashiell; Guilford; Ruch; Woodworth. Seven supplementary books, used in the elementary course in psychology at the University of Illinois, are also recommended.

Obviously, with this advice to students and with applicants for a proficiency examination having varying backgrounds of preparation, a proficiency examination should not be based upon a particular textbook or elementary course in psychology. Rather, the examination should be based upon "the established facts and principles of psy-

* Professor Woodrow suggested the equations which we have used in this study and read the manuscript.

chology." We could, of course, require the study of a specific content as the prerequisite for taking a proficiency examination and, in the end, this may prove to be the best plan. But we assumed that there is a general body of fact and principle which can be designated *psychology* and that a proficiency examination must be a test of the degree of mastery of this body of fact and principle.

To secure simplicity and objectivity in scoring the proposed proficiency examination, a new-type examination with short-answer questions upon the main topics of elementary psychology was prepared.*

The list of topics includes: definition and scientific method, development, motivation, conflict and adjustment, emotion, attention, reaction, perception, learning, problem solving, memory, intelligence and aptitude, personality, individual differences, and the bodily basis of behavior. While this list of topics is arbitrary, the examination was agreed upon by the persons writing it as giving a fair balance and emphasis to the subject matter of elementary psychology. When completed, the examination had a total of 302 points, the multiple choice questions carrying double weight and the true-false statements carrying single weight.

The examination was first used as a final examination in two divisions of the elementary course in January, 1943, a total of 288 students taking it. Following this, the examination was revised to eliminate ambiguous items and those based too specifically upon the textbook of the course.

The revised examination was used as a pre-test in psychology on the first two class hours of a course in elementary psychology commencing in the fall of 1943. The students were told that their scores would not affect their semester grades but they were urged, nonetheless, to do their best. They were told that this examination had been used as a final examination in the previous course and that we wished to compare their performance at the start with that of students at the close of the previous course. We stressed the value of the examination as an educational exercise which would acquaint them with the kind of examination to be used in the course, with the content of the course, and with the kind of information and skill we expected them to attain, etc. There were many observable indications that the students coöperated and were serious about the examination, and none to the contrary. There was no hint that the identical examination would be used as a final examination at the close of the course.

* The examination was prepared and revised by members of the staff teaching elementary psychology at the University of Illinois in the divisions of Dr. P. T. Young, and include Drs. I. A. Berg, H. B. Carlson, J. W. Gebhard, M. J. Kientzle, F. McGehee, Mr. J. M. Rich, Miss D. Simrall, and Dr. S. M. Watson.

The examination, however, was used as a final examination at the close of the course without warning or comment, in order to obtain an index of the extent of improvement in knowledge of psychology. It is of interest to note that no student commented upon the similarity between the pre-test and the post-test. It may be that some students recognized the examination as that previously taken, or recognized some of the items, but simply did not comment upon the fact. On the other hand, with an entire semester of study intervening between pre-test and post-test, it is quite possible that the examination as a whole was not recognized, even though specific items were somewhat familiar.

During the course we administered the Otis test of mental ability (Gamma test: form Am) to illustrate intelligence testing. In this way, we obtained intelligence test scores to be correlated with scores made in the pre-test and post-test.

Although there were 201 students in the course, we have limited the present study to 118 who took the pre-test, the post-test, and the Otis. The discrepancy between the two figures is due mainly to an unprecedented withdrawal of students during the semester to enter the military services and other forms of war work. A few students who completed the course were absent from the pre-test and others were absent on the day the Otis test was given.

The error scores of these 118 students in the pre-test and in the post-test are given graphically in Figure 1. Also, as a matter of interest, we have added the error scores of the twenty individuals who took this test as a proficiency examination in psychology during the year between March 1, 1943 and March 1, 1944. These twenty individuals were undergraduate students at the University of Illinois who attempted to obtain credit in elementary psychology without attending the regular classes.

The median error score for the pre-test is 113. The median error score for the post-test is 58. There is thus a gain of 55 points between the medians of the pre-test and post-test representing improvement in elementary psychology as a consequence of instruction, increased familiarity with this type of examination, perhaps increased motivation, and possibly other factors.

The data presented above were analyzed by correlation techniques with the following results.

The error scores on the pre-test were correlated with the scores on the post-test by means of the Pearson product-moment method of correlation. The value of $r$ thus obtained is .504. In general, then, students who did relatively well on the pre-test also tended to do relatively well on the post-test, while those who did poorly on the pre-test tended to do poorly on the post-test. The pre-test could be used, therefore, to

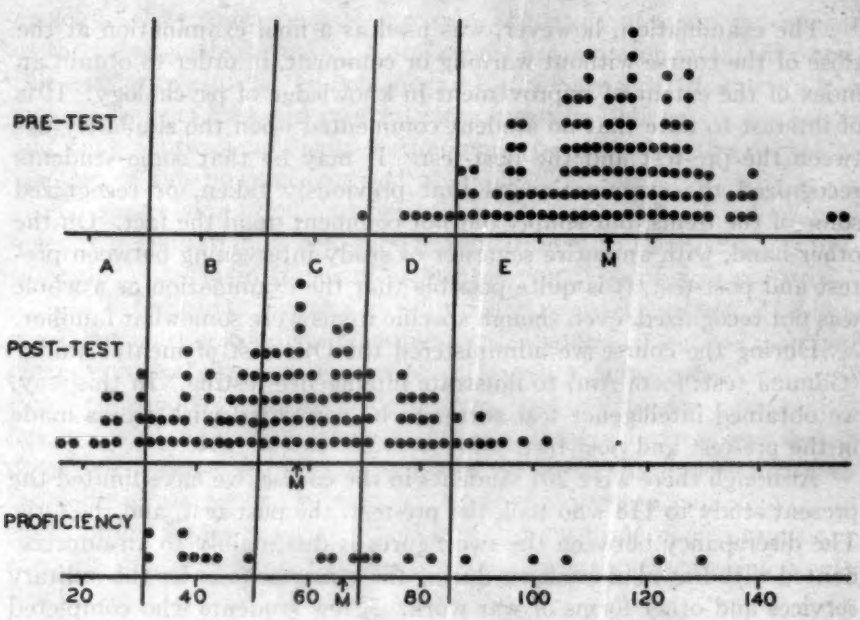


FIGURE I. DISTRIBUTION OF ERROR SCORES

The upper distribution presents error scores of 118 students who took the examination as a pre-test in psychology; the median score (M) is 113. The central distribution gives the error scores for the same students at the close of the course; the median (M) is 58. The lower distribution shows the scores of twenty students who took the test as a proficiency examination in psychology during the year between March 1, 1943 and March 1, 1944; the median (M) for this group is 68. Error scores for the three distributions are shown along the base line of the figure. Vertical cross lines indicate the divisional points for the letter grades (A, B, C, D, E) on the post-test.

predict aptitude for elementary psychology about as well as most scholastic aptitude tests predict college grades.

It is possible to check this conclusion by correlating the scores made on the Otis test with the scores on the pre-test and the post-test. Since the scores on the pre-test and the post-test were error scores, the sign of the coefficient of correlation of these with scores on an intelligence test must be inverted to be consistent with the usual practice of letting high scores indicate good performance. The correlation coefficient between the pre-test and the Otis test is .556, while that between the post-test and the Otis test is .429. These correlations give evidence favorable to the conclusion just made.

While the scores on both pre-test and post-test correlate positively with scores on the Otis, the magnitude of the correlation is greater in the case of the pre-test than in the case of the post-test. It would thus appear that intelligence is more involved as a determiner of scores in the pre-test than it is in the post-test.

Woodrow (2) has shown that the effect of practice upon a test which correlates positively with intelligence is generally to *lower* the degree of relationship as indicated by the correlation coefficient. Our finding is in line with Woodrow's conclusion in so far as the learning which occurs in a college course of the sort here considered is analogous to the learning which occurs with practice under laboratory conditions. In the present instance other factors than practice are involved. Some of these may be differences in motivation, in efficiency of study habits, in opportunity to study as dependent upon health, financial status, environmental factors not under control of the student, as well as personality problems and emotional strain while under pressure of the post-test which was the final examination for these students.

It is possible to demonstrate that intelligence is not correlated with gains in achievement in psychology. One way to do this is to correlate the scores on the Otis test with difference scores between pre-test and post-test. These difference scores give objective evidence of improvement in psychology, but not unambiguously so. This measure of improvement is open to the objection that a gain of $n$ points is relatively more difficult to achieve at the low error end of the distribution than at the high error end of the distribution, *i.e.*, a change of 10 points from 10 errors to 0 errors is probably much more difficult to achieve than is a shift from 150 errors to 140 errors. Further, since there is a ceiling of zero errors, a score of 10 errors on the pre-test can improve a maximum of 10 points whereas a score of 150 errors on the pre-test has the possibility of improving a total of 150 points. However, in the absence of any other objective evidence of improvement in achievement in psychology we decided to use difference scores.

Instead of calculating the difference scores as indicated, it is possible to determine the correlation between gains and the intelligence scores more simply by means of an equation suggested by Woodrow. This equation is:

$$r_{Ig} = \frac{\sigma_{P2} r_{IP2} - \sigma_{P1} r_{IP1}}{\sqrt{\sigma_{P1}^2 + \sigma_{P2}^2 - 2 r_{P1P2} \sigma_{P1} \sigma_{P2}}}$$

in which,

$r_{Ig}$ = correlation of intelligence with gains
$r_{IP1}$ = correlation of intelligence with pre-test
$r_{IP2}$ = correlation of intelligence with post-test
$r_{P1P2}$ = correlation of pre-test with post-test
$\sigma_{P1}$ = standard deviation of pre-test
$\sigma_{P2}$ = standard deviation of post-test

The correlation thus obtained is $-.039$, which very definitely indicates the lack of any significant correlation between gain scores and Otis scores. Surprising as this result may seem, it is consistent with the finding of other investigators.

Drake (1), for example, found a correlation of −.14 between scores on the A. C. E. scholastic aptitude test and gain in knowledge of biology as measured by two forms of the Coöperative Test Service Biology Test, with 217 students. His measure of gain was the difference between initial and final standard scores. He believed that the explanation of his results necessitated the postulation of a growth factor not related to intelligence which he called the "Iota Function."

Do students who come to the course best prepared (as measured by their scores on the pre-test) gain more through practice and tuition in the materials covered by the test (as measured by the difference between post-test and pre-test scores) than those who come less well prepared? The answer to this question can be found by correlating the gain scores with the pre-test scores.

In studying the problem we made use of an equation suggested by Woodrow, as follows:

$$r_{P1g} = \frac{\sigma_{P2} r_{P1P2} - \sigma_{P1}}{\sqrt{\sigma_{P1}^2 + \sigma_{P2}^2 - 2 r_{P1P2} \sigma_{P1} \sigma_{P2}}}$$

in which,

$r_{P1g}$ = correlation of pre-test with gain
$r_{P1P2}$ = correlation of pre-test with post-test
$\sigma_{P1}$ = standard deviation of pre-test
$\sigma_{P2}$ = standard deviation of post-test.

The correlation thus obtained is −.359. This coefficient of correlation is exaggerated because chance errors in the pre-test scores are negatively correlated with the same chance errors in the gain scores. To eliminate this spurious effect it is necessary to correct for unreliability each statistical element in the equation. This can be done by substituting the coefficient of correlation between pre-test and post-test after its correction for attenuation, and the true standard deviations for both pre-test and post-test. The corrected coefficient of correlation between pre-test and gain is −.010. This shows that there is no relation between initial knowledge of the content of the introductory course in psychology as measured by this proficiency examination and the gains made by the students.

The correlation between post-test and gain may be obtained by the following equation:

$$r_{P2g} = \frac{\sigma_{P2} - \sigma_{P1} r_{P1P2}}{\sqrt{\sigma_{P1}^2 + \sigma_{P2}^2 - 2 r_{P1P2} \sigma_{P1} \sigma_{P2}}}$$

in which,

$r_{P2g}$ = correlation of post-test with gain
$r_{P1P2}$ = correlation of pre-test with post-test
$\sigma_{P1}$ = standard deviation of pre-test
$\sigma_{P2}$ = standard deviation of post-test.

This coefficient of correlation is .625. However, since this coefficient of correlation is influenced by chance errors in the post-test which are positively correlated with the same errors in the gain scores, the value must be corrected in the same manner as that used above in correcting the correlation between pre-test and gain scores. The corrected coefficient is .712, which indicates that those students who gained most from the course also had the highest post-test scores and that those who gained least had the lowest post-test scores.

Since we have shown that gain scores (post-test minus pre-test) for our group of students do not correlate with intelligence nor with initial knowledge of elementary psychology, other factors than intelligence and prior knowledge must account for the improvement in achievement. We do not have specific evidence to indicate what these factors are, but we would expect that among the more important ones are interest and motivation, opportunity to study, effective study habits, traits of personality, and emotional conflicts both at the time of study and at the time of taking the examination. At any rate, it is apparent that non-intellectual factors must be assumed to account for differential improvement in achievement in the introductory course in psychology so far as that improvement is measured by our test.

In summary, the examination which we prepared to measure proficiency in elementary psychology is to some extent a measure of intelligence. When the proficiency examination in psychology is taken prior to formal study of psychology the correlation coefficient of the scores on this test with the scores on the Otis Gamma test of intelligence is .556. However, when the same psychology examination is taken after formal training, the correlation with the same test of intelligence drops to .429. The correlation between gain in score on the same test following practice and tuition in the material covered by the test with scores on the Otis test is found to be −.039. This coefficient indicates clearly the lack of any significant correlation between gain in score and intelligence. The correlation between gain in score and the pre-test is −.010, indicating that the pre-test cannot be used to predict the amount of gain a student might be expected to achieve in the course. The correlation between gain in score and post-test is .712, indicating that the post-test scores are closely related to gain in achievement.

There are several possible interpretations of these results. One of these is that the proficiency test which we used was largely a memory test and, therefore, did not measure increased understanding of principles. Another possible interpretation is that perhaps the ceiling or task limit of the test was too low to permit students with good scores on the pre-test to show their progress to the fullest degree. A further interpretation is that improvement following tuition is largely dependent

upon non-intellectual factors. Among the more important of these we would expect to find interest and motivation, opportunity to study, study habits, personality traits, and emotional conflicts at the time of study and at the time of taking the examination. These factors call attention to the importance of non-intellectual processes in accounting for differential improvement in achievement.

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# PSYCHOLOGY IN THE TRAINING OF OCCUPATIONAL THERAPISTS

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Professional training in occupational therapy approved by the American Medical Association is now being offered in fourteen colleges and universities in the United States and Canada. Recently nine additional colleges and universities have organized courses designed to meet the requirements set forth by the Council on Medical Education and Hospitals of the American Medical Association which regulates the standards by which schools are accredited. Graduation from an accredited course leads to eligibility for the Directory of Registered Occupational Therapists maintained by the American Occupational Therapy Association. To meet the demands for occupational therapists in army, navy, and civilian hospitals, many colleges and universities have provided instruction and clinical training to enable students to fulfill the educational requirements of a registered therapist.

In August of 1943 the University of Illinois established a nine-semester curriculum leading to a Bachelor of Science degree in occupational therapy in the College of Medicine. Theoretical training is offered in the biological and social sciences, clinical subjects, and theory of occupational therapy. Technical training is offered in the therapeutic arts and crafts, educational and recreational therapy. Clinical training includes practice in general, orthopedic, tuberculosis, mental, and children's hospitals.

Fifteen hours of biological science required by the American Medical Association includes at least two courses in psychology, one of which is the general introductory course. The second course in psychology for students in the occupational therapy curriculum at the University of Illinois, is the topic of this paper. There were two purposes in designing the course: (1) the application of the principles of psychology to the theory and practice of occupational therapy and (2) the preparation of students for lectures in psychiatry at the Medical School in Chicago. Psychology Applied to Occupational Therapy is the course which developed in an attempt to bridge the gap between introductory psychology and psychiatry in the professional training of occupational therapists. The content of the course as offered at the University of Illinois in the fall of 1943 is presented in the outline shown on the next page.

Individual differences in intelligence, motivation and adjustment are emphasized throughout the course to enable the student in occupational therapy to understand and appreciate the problems in self-

PSYCHOLOGY APPLIED TO OCCUPATIONAL THERAPY

(Psychology 36)

*I. Analysis of Behavior*
- Stimulus and response
- Emotion
- Intelligence
- Learning
- Motivation
- Adjustment

*II. Methods of Appraising Personality*
- Psychological tests
- Rating scales
- Case history
- Interview
- Observation on life situations
- Questionnaire
- Play techniques with children
- Projective and apperceptive tests

*III. Understanding the Abnormal Personality*
- General criteria of abnormal personality
- Psychopathological symptoms
- Pathogenic and psychogenic factors
- Case material
  - The normal individual
  - The mentally deficient
  - The psychotic
  - The neurotic
  - The psychopathic personality

*IV. Psychology of the Physically Handicapped*
- The crippled
- The blind
- The hard of hearing
- Speech defectives

*V. Mental Hygiene*
- For the occupational therapist
- For the hospitalized and convalescent patient.

adjustment, educational, social, and vocational adjustment with which the physically and mentally handicapped individual is confronted. By understanding the patient as an individual, discovering his interests, appraising his abilities, encouraging him to face problems and to solve them by employing the scientific method, and finally by motivating the individual through muscle reeducation to develop skills in constructive activities, the occupational therapist aids the patient in his physical and mental recovery and thereby effects a personality readjustment, releasing the rehabilitated individual for usefulness in some worthwhile field of endeavor.

# PSYCHOLOGY AND THE WAR

Edited by

DONALD G. MARQUIS

CONTENTS



## PSYCHOLOGICAL ACTIVITIES IN THE TRAINING COMMAND, ARMY AIR FORCES

STAFF, PSYCHOLOGICAL SECTION

*Office of the Surgeon, Headquarters, Army Air Forces Training Command*
*Fort Worth, Texas**

This article is the seventh in a series describing the Aviation Psychology Program of the Army Air Forces. In previous articles (2, 3, 4, 5, 6), the activities of the individual units have been described. The first article of the series (1) described the organization and general functions of the Program up to July 1943. The present report treats the development of the Aviation Psychology Program in the AAF Training Command subsequent to the period covered by the first article, and is to a large extent a report of the activities of the Psychological Section, Medical Division, Headquarters, AAF Training Command. This office has been the operating agency for the psychological testing and classification of aircrew trainees since the summer of 1942, and has been responsible for the supervision of psychological research in the AAF Training Command since shortly before the close of 1943. The Aviation Psychology Program which is under the general supervision of the Psychological Branch, Research Division, Office of the Air Surgeon, now has units in the AAF Personnel Distribution Command, in the Continental Air Forces and in some overseas Air Forces. These other activities will be referred to only incidentally in the present article.

* This article was prepared by the Staff of the Psychological Section and edited in the Psychological Branch, Research Division, Office of the Air Surgeon, Headquarters, Army Air Forces, Washington, D. C.

## I. Mission

The Psychological Section, Medical Division, Army Air Forces Training Command was established on 21 April 1942 and was assigned primary responsibility for the "application and correlation of the various tests used in the classification of aircrew members." In addition to directing routine testing activities throughout the Training Command, this implied also the collection of test results and training criteria and the performance of various statistical analyses in the determination of the validities of the individual tests and of the classification test battery as a whole. Subsequently, the mission of this Section was expanded to include the supervision and coordination of psychological research activities, including test development, the preparation of recommendations to Headquarters, Army Air Forces for changes in the nature of the classification test battery, and the publication and distribution of technical and non-technical reports of psychological research and classification testing.

## II. Organization and Personnel

In order to achieve a certain degree of specialization of responsibility and function, this Section was subdivided into four units: Administrative, Statistical, Field Studies, and Research. The Administrative Unit is responsible for determination of policy, matters of budget and supply, personnel management and records, and the integration of the activities of the other units. The Statistical Unit is responsible for the flow and maintenance of records, and the performance of the various statistical analyses demanded by the routine testing and research activities of the program. The Field Studies Unit was entrusted with the task of securing and studying criterion data, performing job analyses, and maintaining liaison with various training agencies in the field. The Research Unit's functions and achievements have been reported in a previous article (6).

As indicated in the original article of this series (1) applicants for Aviation Cadet training who passed the Aviation Cadet Qualifying Examination before the end of October 1943 entered a period of basic military training which was followed by five months of instruction in a college or university. Applicants were then sent to a classification center where they were given the psychological classification tests and were assigned to a specific type of training depending upon the aptitude scores which they obtained, the preferences which they stated and the quota requirements of the Army Air Forces. This system had some obvious defects, notably that of retaining throughout a lengthy period men who would eventually be disqualified on the basis of their test performance.

When, on 7 July 1943, the Army Air Forces Training Command was activated as a combination of the Army Air Forces Flying Training Command and the Army Air Forces Technical Training Command, and all agencies concerned came within a single jurisdiction, it was decided to perform the psychological

classification testing at Basic Training Centers before the applicant was admitted to the college course. Since a large number of applicants who were already in college had to be tested upon termination of their college course, while at the same time new trainees were to be tested prior to their college training, an immediate expansion of the testing program became necessary.

In order to accomplish this expansion, Medical & Psychological Examining Units were set up at seven Army Air Force Basic Training Centers. These units were responsible for precollege testing while the Psychological Research Units continued to test those men who had completed their college course. The expansion necessitated the testing of approximately four times as many men per unit time and raised a number of problems with respect to psychological personnel procurement and training and maintenance of standardized classification procedures.

To cope with these problems, a new unit, the Test Operations Unit, was added to the organization of the Training Command Headquarters Psychological Section and entrusted with the planning of all aptitude testing activities and psychological processing in the field units. At the same time the Field Studies Unit, whose mission was believed to have been substantially accomplished, was disbanded and a Field Research Unit was formed which had the major function of coordinating psychological research activities. The need for such coordination had become more and more pressing as personnel were dispersed into many field units and as the areas of study became more varied. The former Research Unit was moved at this time to Santa Ana Army Air Base, Santa Ana, California, became specialized in its function, and was designated the Psychological Test Film Unit (6).

By 1 November 1943 the Psychological Section, Headquarters Army Air Forces Training Command consisted of an Administrative Unit composed of Lt. Colonel (now Colonel) F. A. Geldard, Major (now Lt. Colonel) A. P. Horst, and Captain (now Major) B. F. Kraffert, Jr.; a Field Research Unit composed of Lt. Colonel J. P. Guilford, Captain (now Major) R. L. Thorndike, Captain (now Major) R. T. Sollenberger, Captain (now Major) E. H. Kemp, Captain (now Major) S. R. Wallace, Jr., and Captain L. F. Carter; a Test Operations Unit composed of Major E. E. Ghiselli and 1st Lt. (now Captain) B. von H. Gilmer; a Statistical Analysis and Records Unit composed of Major W. L. Deemer, 1st Lt. (now Captain) L. Berwick, 1st Lt. (now Captain) G. B. Simon, and Mr. A. G. Whitney.

## III. Supervision of Classification Testing and Processing

The major function of this Section has been and continues to be the supervision of psychological classification testing and of the preparation of recommendations for aircrew training assignment based upon psychological procedures. A description of the general procedures employed may be found in the first article of this series (1). However, it may be of interest to indicate some of the changes which were made in these procedures and some of the problems which attended those changes.

The necessity for the activation of the seven Medical & Psychological Examining Units has been discussed above. The magnitude of this change may best be appreciated in terms of a comparison between the number of men

tested before and after the establishment of these units. For example, slightly more than 4,000 trainees were tested nationally per week in October 1943, and this may be regarded as a representative rate for the preceding year. In the week ending 18 December 1943, however, less than two months after the establishment of the Medical & Psychological Examining Units, approximately 15,000 trainees were tested. In the period between 1 July 1943 and 30 June 1944, approximately 338,000 men were completely tested with the psychological classification battery. In order to accomplish testing in such large numbers, it was of course necessary to obtain the services of many individuals with psychological training. This problem of personnel procurement, never an easy one, became particularly acute when the Medical & Psychological Examining Units were established and the flow of men to be tested increased. A basic nucleus for each of the Medical & Psychological Examining Units was provided by transfer of experienced officers and enlisted men from the three Psychological Research Units. These cadres were supplemented with men who had previously served as enlisted men at Psychological Research Units and subsequently graduated from Officer Candidate Schools, and with officers with psychological training who had been assigned to other duties within the Training Command. Some 200 enlisted men were obtained from the Army Specialized Training Program in which they had received training in psychological testing. These were supplemented by other enlisted men without psychological training who were believed capable of learning to carry out satisfactorily the more routine testing duties.

As the usefulness of the Classification Test Battery for the prediction of graduation or elimination from flying training became apparent and as changes in procurement policies increased the number of aircrew applicants, minimum qualifying aptitude scores have been raised by the action of Headquarters, Army Air Forces. At the present time, in order to qualify for pilot training, an applicant must obtain a pilot aptitude score of 6. The minimum qualifying bombardier aptitude score is also 6, while qualification for navigator training depends on a navigator aptitude score of 7.* The determination of these qualifying scores is a complex matter which involves many considerations. Not the least of these springs from the fact that the qualifying scores must be so balanced as to qualify a sufficient number of trainees for each air-crew specialty. The general trend of changes in minimum qualifying scores has been one of progressively cutting off more and more individuals, until only about half of the applicants who are tested now qualify for one or more of the Aircrew Officer specialties.

* The method of obtaining these aptitude scores is described in the first article of this series (1). The scores are expressed on a nine-point scale based on half standard deviation units for a normally distributed group. A pilot aptitude score of 6 therefore extends from one-quarter to three-quarter standard deviations above the mean in a normalized distribution of scores of all men who take the tests, having previously passed the Army Air Forces Qualifying Examination. It is of interest to note that the term "stanine" has been coined for these scores and has found wide acceptance. It seems highly probable that the term is destined to become good psychological jargon, as it has already attained widespread military usage.

## IV. Basic Data

The data upon which the Training Command Psychological Program has been largely based in both its operational and research functions are obtained from the field units and the training schools. The maintenance of these records is the responsibility of the Statistical Unit. This Unit has faced and solved a number of knotty problems resulting largely from the magnitude of the testing program and the new methods involved in preparing data for use with IBM machines. Data on all men tested with the classification battery are reported by the field units on cards and rosters.

A name card for each man tested gives the individual's name, date and place of testing, testing number, army serial number, age, marital status, education, and previous flying experience. Other non-test data, reported by roster, are: medical qualification, military and training status, strength of interest for each type of training, first preference for type of training, and preference waiver (the individual is given an opportunity to indicate his degree of willingness to be classified for the form of training for which his aptitude score is highest regardless of his preference). Test and classification data, also reported by roster, include scores on each of the tests in the battery, aptitude scores for each aircrew specialty, the classification recommended by the Psychological Unit, and the actual assignment made by the Assignment Board. The data received from the training schools are in rosters which give the name, army serial number, and disposition (graduation, elimination and cause, holdover and cause, etc.) of each man in training.

The processing of the records, maintenance of the files, and the analysis of these data are performed primarily on IBM machines. The data are entered on punch cards which are filed in various ways in order to expedite collation and to facilitate the many searches which must be made in connection with special studies. At the present time, the Statistical Unit maintains ten such files arranged variously by army serial number before graduation, by officer serial number, by testing number, by class, and alphabetically, by name. Besides accumulating and collating the psychological data and training information, the Statistical Unit disseminates these data in the form of rosters and punched cards to the field units and psychological detachments outside the Training Command.

An indication of the magnitude and extent of the records now being maintained may be obtained from the following facts. Over one-half million individuals are represented. Approximately six million punch cards are at present in active files, and an additional two million are in temporary and inactive files.

In the course of the basic record keeping and research with these records on IBM cards a number of unusual applications of IBM machines have been employed and several new techniques have been developed. Without going into technical detail, it may be of interest to

note some of the applications of IBM machines to the problems of the Psychological Program.

1. *Procedure for Alphabetic Collating.* Normally the collator will not merge alphabetically. By coding the alphabetic zone punches, the collator can be made to recognize alphabetic punching and thus merge alphabetically. In this way, newly alphabetized cards can be economically merged in the previously alphabetized cards to keep a current alphabetic file.

2. *Procedure for Obtaining Frequency Distributions on the Tabulator in Intervals of Between 1 and 10.* Ordinarily by controlling on the tens position a distribution in intervals of ten is obtained and by controlling on the units position a distribution in intervals of one is obtained. With the aid of specially prepared interval heading cards—distributions in intervals of any number between 1 and 10 may be obtained.

3. *Procedure for Converting Three Strengths of Interests to First Preference on the Collator.* The problem of converting the expressed strength of an interest on a 1 to 9 scale for Bombardier, Navigator, and for Pilot training to a 1st preference: i.e., picking the highest rating, including all combinations of ties, had to be solved. Although ordinarily the collator compares only two things and decides whether they are equal or one is higher or lower, a method has been developed for making this 3-way comparison, picking the highest of the three and ties.

4. *Correlation Methods.* Several different methods for obtaining the basic data ($\Sigma X, \Sigma Y, \Sigma XY, \Sigma X^2, \Sigma Y^2$) necessary for computing correlation coefficients are used. The typical correlation problem encountered is one involving some 30 2-digit variables for about 5,000 cases. The most useful method is one involving digiting and progressive totals with the cutting and tabulating of summary cards. Elaborate check techniques are used. When this method is applied to 2-digit and 3-digit variables, it is possible to select and position information so that the tabulation of summary cards will yield a single total for the sums of squares and cross products.

5. *Biserial Distributions and Sums of Squares.* Using digiting, class selection, progressive totals, and total transfer, pass-fail distributions are obtained yielding the sums of squares for the total group at the same time as the distributions are obtained.

6. *Headings and Board Checks.* Special Headings Cards are used to identify completely each run and each group of cards (i.e., each population or sample). Complete board checks are mandatory. The board check is an elaborate run designed to give printed proof of everything the machine is supposed to be doing.

## V. Development and Validation of Devices for Predicting Aircrew Success

The general procedures followed in the development, application, and validation of the Classification Test Battery have been outlined in the initial article of this series. Job analyses, test construction, and validation of tests in the Classification Test Battery and of experimental tests which are candidates for inclusion in the battery have continued. One point which has been forcibly brought home to members of the program is that validation analyses must be routinely performed on all

tests employed. Validity estimates even when obtained on very large samples, have fluctuated to a substantial degree. However, by cumulating data from many large samples and by using a large number of tests in the Classification Battery it has been possible to obtain a gradual, consistent improvement in the validity of the composite aptitude scores in successive revisions of the battery.

The battery employed throughout the greater part of the current year includes 18 tests, of which 12 are of the paper and pencil variety and 6 are individual apparatus tests. Some of these tests are chiefly of value in the prediction of one particular specialty, others are weighted for two, three, or in some cases for all of the various aircrew specialties. It is of interest to note that the best weighting of the 12 printed tests for predicting success in primary pilot training schools gives an estimated multiple validity coefficient equal to the best weighting of the 6 psychomotor tests (.51). The best weighting of all tests combined gives a multiple validity coefficient of .60. These figures are based on validity coefficients and intercorrelations obtained from several thousand cases. The data appear to justify the increased expenditure entailed by the use of apparatus tests.

From the outset it has been recognized that the only valid basis for any system of selection and classification of personnel for the various aircrew specialties is proficiency in combat. However, at the time the research program was started this country was not at war. Furthermore, it was believed that as a tentative criterion of the suitability of individuals selected, the judgments of instructors and AAF officers serving as check pilots and supervisors would provide the most useful and valid evaluations of the men selected which could be obtained within a reasonable period following their selection and classification.

In a preliminary study made during the summer and fall of 1941 it was determined that the most carefully made decision about a student in flying training schools is whether to send him on to the next stage and eventually to combat or to eliminate him from further consideration and training in that specialty. This decision is usually based on the separate judgments of several persons who have flown with the individual to check the original estimate of the instructor. In instances where it is believed another instructor might regard the student as promising, he is given another opportunity for training with a new instructor. Although it is recognized that variation in standards not only of individual instructors and check pilots but also of schools and classes, will attenuate the validity coefficients obtained, the general comparability of the values obtained from samples with quite different proportions of graduates and eliminees is insured by using biserial correlation coefficients.

Before a test is included in the Classification Battery, therefore, it is validated upon a number of samples. When possible, it is validated against the graduation-elimination criterion in elementary, basic, and

advanced pilot training and in specialized navigator and bombardier training. However, a test may be considered for inclusion in the composite pilot aptitude score upon the basis of its validity for elementary pilot training alone since by far the largest proportion of elimination occurs during that phase. This procedure is also justified on the basis of data which demonstrate that the validity of a test for elementary training does not differ very greatly from its validity for elementary, basic, and advanced training combined. Validation of experimental tests for bombardier or navigator training presents a more difficult problem because only a small proportion of aircrew applicants enter such training, and a very large group of unclassified applicants must be tested in order to provide an acceptable sample. This problem has been met by giving, at a later stage, experimental test batteries composed of tests specifically designed for these forms of training to applicants who have already been classified for them.

Periodically, data obtained from the validation of experimental tests and from the routine validation of the Classification Battery are evaluated, and indicated adjustments in the composition and weighting of the battery are made. The multiple regression technique is used in determining the weight of each test for each of the three psychological aptitude scores. The estimates of test validities obtained from validation studies are employed. These are occasionally regressed, however, when in the judgment of the Aviation Psychologists they can be improved by utilizing additional information. For example, when an experimental test, on the basis of a few samples, shows unusually high validity, a somewhat lower validity estimate is assigned to it in order to take account of the expected shrinkage in subsequent samples and to avoid placing too much confidence in the stability of a single test. Occasionally, too, when a test is believed to be very promising on the basis of observation, reports, and analyses of combat requirements, and insufficient data are available for an estimate of validity, the test is weighted by judgment and included in the battery. A new weighting is then made when validity data mature.

The determination of test weights has been accomplished separately for each aircrew specialty. That is, a set of weights for pilot has been determined by combining tests in such a way as to give the maximum prediction of the pilot criterion, a second set has been prepared in the same way for navigator, and a third set for bombardier. The three resulting composite aptitude scores have shown substantial positive intercorrelations—usually between .50 and .70 but in certain batteries as low as .20 and as high as .90. Since minimum qualifying scores have been set so as to disqualify a large number of individuals from each of the three aircrew specialties, and a substantial number from all three,

it is apparent that the test results have served in part a selection function. Classification—the determination of the one of several categories to which each man can most profitably be assigned—has been achieved somewhat indirectly by this multiple cut-off procedure. In addition, the psychological processing units have considered the stanine scores, preferences and strengths of preferences for each individual for a specific type of training.

The statistic employed as the estimate of validity of each test has been the biserial coefficient of correlation. In the use of this coefficient there have arisen some problems of which the most difficult is concerned with the application of corrections for the restriction of range. Since the group which enters aircrew training is first screened on the basis of the Aviation Cadet Qualifying Examination (now designated as the AAF Qualifying Examination) there is little doubt that the range of scores on each of the tests is restricted to varying degrees. Further restriction occurs as a result of the use of minimum qualifying aptitude scores (stanines). Correction for the restriction resulting from the Qualifying Examination has, thus far, not been made. Formulas for the correction of the second type of restriction have been employed, although it is not believed that this problem has been solved to a completely satisfactory degree because it appears that not all of the assumptions on which the known formulas are based are valid. More information in this regard should be available as data mature for an experimental group of approximately 1,500 candidates admitted to pilot training without regard to scores on the Qualifying Examination or the classification tests.

In any case, it has been recognized that the usefulness of the biserial coefficient is primarily that of a tool for the statistical manipulation of data rather than a true statement of the contribution of the test battery to effective selection and classification. Furthermore, military authorities are not inclined to interest in esoteric statistical devices. The basic data employed in evaluating the effectiveness of the test battery and in coordinating the results of psychological testing with the establishment of minimum qualifying scores are, therefore, presented in the form of tables of elimination rates by stanine. Thus, an examination of Figure I will show that, while less than 5% of the group receiving the highest pilot aptitude score were eliminated from elementary training, almost 80% of those receiving the lowest score were eliminated. The individuals with very low stanines were sent into training early in the war, before minimum stanine requirements were established. If the current minimum qualifying score of 6 for pilot training had been in force for the entire group shown in Figure I and the same elimination-graduation policy had been maintained, 70% of the potential eliminees

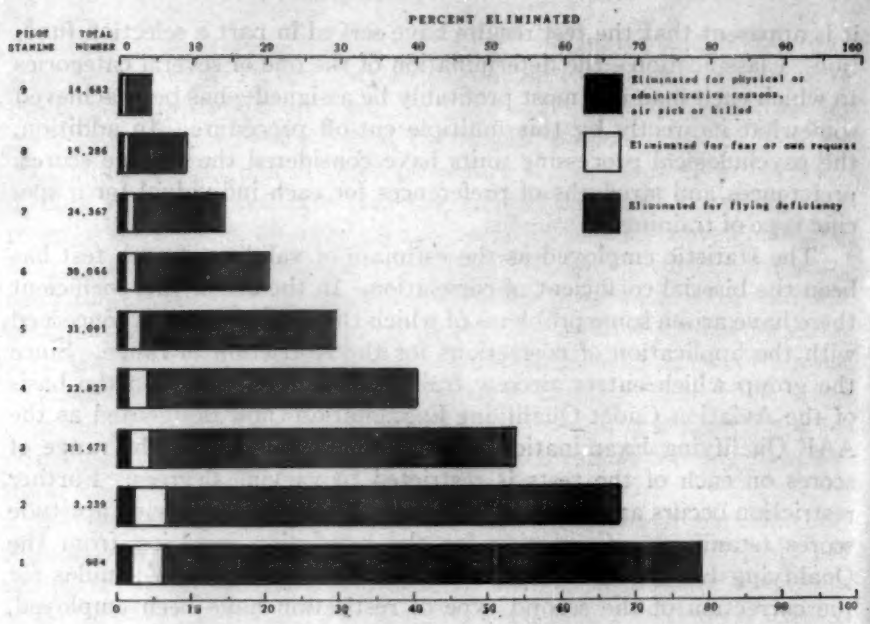


FIGURE I. PER CENT ELIMINATED FROM PRIMARY PILOT TRAINING.

This includes those eliminated for flying deficiency, fear or own request, and physical or administrative reasons for each pilot stanine in fifteen consecutive pilot classes totaling 153,000 cases. The overall elimination rate is 25%.

would have been disqualified but only 37% of the potential graduates. Actually, of course, these data suffer from the effect of range restriction since many of those obtaining scores of 1, 2, and 3 were disqualified from training. Any statement of the type made above is, therefore, very definitely on the conservative side. Similar data are shown for bombardier and navigator training in Figures II and III. It should be noted that men with navigator stanines of less than five were not permitted to enter navigator training in these classes.

While graduation-elimination from training has been the commonly used criterion employed in the preparation of test weights, other criteria have not been allowed to go unexplored. Interest in these criteria has arisen not only from the desire for improved test validation but also in the hope of obtaining improved standards of proficiency in aircrew tasks which would be more closely related to combat performance. which would provide more sensitive measures to be employed in evaluating training methods, and which, perhaps, might serve as more reliable criteria for the determination of graduation-elimination itself.

The study of various measures which might be employed for these purposes continues. In general, the results have not been encouraging

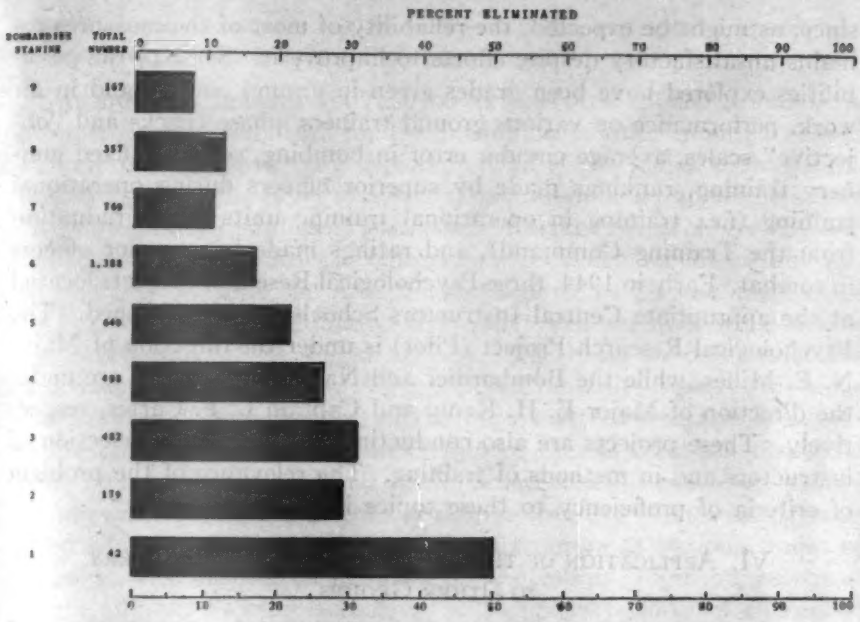


FIGURE II. PER CENT ELIMINATED FROM ADVANCED BOMBARDIER TRAINING.

This includes those eliminated for unsatisfactory progress, fear or own request for each bombardier stanine in four consecutive bombardier classes totaling 4,500 cases. The overall elimination rate is 19%.

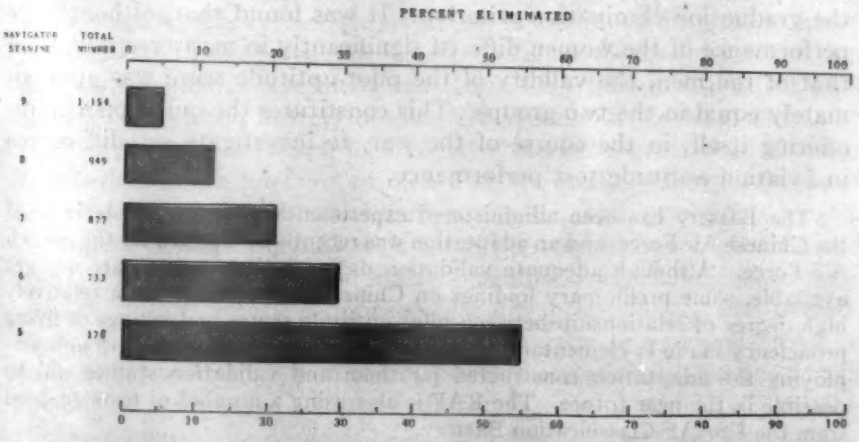


FIGURE III. PER CENT ELIMINATED FROM ADVANCED NAVIGATOR TRAINING.

This includes those eliminated for unsatisfactory progress, fear, or own request for each navigator stanine in six consecutive navigator classes totaling 3,900 cases. The overall elimination rate is 17%.

since, as might be expected, the reliability of most of the measures remains unsatisfactory despite efforts to improve it. Some of the possibilities explored have been grades given in ground courses and in air work, performance on various ground trainers, phase checks and "objective" scales, average circular error in bombing, scores in fixed gunnery training, rankings made by superior officers during operational training (*i.e.*, training in operational training units after graduation from the Training Command), and ratings made by superior officers in combat. Early in 1944, three Psychological Research Projects located at the appropriate Central Instructors Schools were established. The Psychological Research Project (Pilot) is under the direction of Major N. E. Miller, while the Bombardier and Navigator Projects are under the direction of Major E. H. Kemp and Captain L. F. Carter, respectively. These projects are also conducting research in the selection of instructors and in methods of training. The relevance of the problem of criteria of proficiency to these topics is obvious.

## VI. Application of the Classification Test Battery to Other Groups

While the Classification Battery was designed for the selection and classification of applicants for pilot, bombardier, or navigator training, it has also been applied, experimentally, to other groups in the Air Forces and to nationals of our Allies. At the request of those in charge of the Women's Air Force Service Pilot training program, the Battery was administered to a group of women trainees and validated against the graduation-elimination criterion. It was found that, although the performance of the women differed significantly in many respects from that of the men, the validity of the pilot aptitude score was approximately equal in the two groups. This constitutes the only opportunity offering itself, in the course of the war, to investigate sex differences in aviation aptitude test performance.

The Battery has been administered experimentally to aircrew trainees of the Chinese Air Force, and an adaptation was recently completed for the French Air Force. Although adequate validation data for these groups are not yet available, some preliminary findings on Chinese trainees indicate a relatively high degree of relationship between pilot aptitude scores and ratings of flying proficiency made in elementary training. The French authorities are now employing the adaptation constructed for them and validation studies will be possible in the near future. The RAF is also using a number of tests adapted from the USAAF Classification Battery.

Explorations have been made of the potential usefulness of the Battery in the selection of career gunners and various types of specialist gunners, armorer gunners, air mechanic gunners, and radio operator gunners. The validity of the tests for graduation-elimination from aerial gunnery training has been uniformly low and the criterion itself is unsatisfactory because of the low propor-

tion of elimination. Other criteria have been and continue to be investigated but thus far the results have been disappointing.

Just as the Classification Test Battery has been applied to numerous groups, so its possibilities for the prediction of other than success in aircrew training have been explored. One of the major problems attacked has been the effort to detect those individuals who are possessed of the necessary qualities of leadership to make it possible for them to fulfill their responsibilities as officers as well as members of the aircrew. At the present time the AAF commissions some aircrew trainees as 2d Lts. upon their graduation from advanced training while others are issued warrants as Flight Officers. The basis for differential appointment is provided by a Flight Officer Composite Score. This score was developed at the request of the Personnel Division and is a composite obtained from scores on certain of the classification tests, the score on a Flight Officer Final Examination which is composed mainly of judgment items, and a series of ratings obtained from a rating scale upon which each trainee is rated by instructors at various stages of training, with respect to qualities of leadership, judgment, responsibility, military bearing, initiative, self-confidence, force of character, alertness, comprehension, cooperativeness, attention to duty, and professional proficiency. The validation of the Flight Officer Composite Score has never been successfully accomplished because of the absence of reliable and valid criteria of officer quality. Attempts are now being made to discover and develop such criteria, particularly from investigations at the Officer Candidate School and from the voluminous records and ratings in this connection available at the United States Military Academy. It is believed, for example, that some useful information may be obtained as a result of the recent experimental administration of the Classification Battery to some 900 West Point Cadets.

Another problem which has recently received a great deal of attention is that of the selection of men who are qualified for the duties of instructing in pilot, bombardier, navigator, and gunnery training. A number of experimental tests have been developed and validated along with the Classification Battery against various indirect and, in general, unsatisfactory criteria of teaching proficiency. The investigation of such criteria and further research upon this general problem, particularly as it applies to the disposition of personnel returned from combat, is continuing. Most of the work done in the AAF Training Command on this project has been carried out at the three Psychological Research Projects which have worked in coöperation with the Psychological Division, Office of the Surgeon, AAF Personnel Distribution Command.

When a pilot trainee completes basic flying training, he is assigned

either to single engine or twin engine advanced training. The great majority of those who receive single engine training become fighter pilots while most of those who are trained in twin engine planes are subsequently transitioned to medium or heavy bombers. Although job analyses indicate that the skills demanded of the bomber pilot are quite different from those which are necessary for the successful fighter pilot, men have been classified for these specialties almost entirely on the basis of their expressed preferences and their physical characteristics. Since trainees themselves know little about the two specialties, their expressed preferences are highly erratic and based on somewhat peripheral considerations. With a view to differentiating success in operating fighter and bomber planes, studies have been made of the relationship of test scores to various measures of proficiency in specialized pilot training. Much work remains to be done in this area and the newly activated psychological research programs in the four continental air forces are studying this problem intensively.

Recently, combat observation has brought attention to the problems of selecting personnel for lead crews. Since on some missions, especially in the European theater of operations, the success or failure of an entire group may depend upon the effectiveness of a single lead crew, it is of great importance that such crews be composed of the most proficient specialists available. Here again the need for proficiency criteria both in training and in combat is apparent. It is hoped that the efforts of the three Psychological Research Projects and of Psychological Research Unit No. 11 to establish proficiency measures which may be employed at the end of training will be useful in the later assignment of the graduates. A detachment of Aviation Psychologists working recently with the 8th Air Force in England undertook to obtain proficiency criteria under combat conditions, to validate existing tests against such criteria, and to develop and validate new tests which are specifically designed to predict combat performance. Similar research is now underway in other overseas Air Forces.

The ever-increasing importance of radar devices has raised problems concerning the selection of individuals for training in radar techniques and for membership in the radar-specialized pathfinder crews. Investigation of this problem is now in progress but security considerations make it impossible to go into detail at this time.

## VII. Training Research

Training problems have interested the Air Forces psychologists not only because of their intimate relation to the selection problem but also because many of them seemed made to order for those who had spent years in studies of the learning process. Progress in this line has, how-

ever, been somewhat slower than might have been predicted partly because of the exigencies of the military situation and partly because of the difficulty of obtaining satisfactory proficiency measures. One problem to which a contribution could be made was concerned with the improvement of grading procedures in ground courses. Here the principles of educational psychology were immediately applicable. The Armed Forces has for some time employed rating scales of various kinds, and the experience of psychologists in this respect has been useful. One of the most promising of the training research projects is that of work on various types of ground trainers. Not only do such trainers provide the possibilities for obtaining data on the course of learning, but they also give promise of providing valid and reliable proficiency standards. The activities of psychologists in investigating the problems of training in aircraft recognition have been reported in a previous article by the Psychological Test Film Unit (6).

## VIII. Special Studies

Many special research projects which do not fall naturally under the headings thus far discussed have been carried out. To give some indication of their scope, a few of the individual projects may be mentioned. A number of studies have been made and will continue to be made on aircraft accidents, particularly on their relationship to the pilot aptitude score and to various experimental tests. The analysis and interpretation of results is difficult because of the complexity of the situation and most studies have failed to yield clear-cut results. There is evidence indicating that trainees with high pilot stanines have fewer accidents per 100,000 hours of flying in elementary training than do those with low pilot stanines. Special studies are now in progress on groups of cases for which the pilot stanine and training evaluation did not agree. Special groups of high stanine eliminees and low stanine graduates at various levels of training have been selected and compared to each other and to high stanine graduates and low stanine eliminees. Studies have also been made of individuals who are held over in training for one or more classes and of those who are eliminated for training for fear or apprehension or at their own request. These cases have, as a group, lower pilot stanines, but it is proposed to attempt to discover what, if any, characteristics are peculiar to them. A number of studies have been made of mean stanines, graduation rates, and validity coefficients for various training classes and schools. Until recently schools have not been homogeneous with respect to pilot aptitude scores represented in their populations and, as might be expected, this has been associated with a heterogeneity of elimination rate from school to school. The relationship between the pilot stanine and elimination rate by school is very significant, as is the

relationship between mean pilot stanine and elimination rate by training class. Despite differences in mean pilot stanine and in elimination rate from school to school and from class to class, however, validity coefficients for schools and classes usually varied only to an extent that would be expected by change.

## IX. Publications

It has been recognized that in a program of such magnitude it is of primary importance to insure that the personnel, no matter how widely dispersed, will be kept cognizant of the work of their colleagues. For that reason the Field Research Unit has routinely published and distributed a number of publication series. A series of Research Bulletins, of which 49 were published in the fiscal year 1943–1944, have reported significant findings of various research projects and the routine validations obtained from various training classes. Nine Technical Bulletins were published in which various technical and methodological questions, mainly of a statistical nature, were discussed. Three Analysis of Duties Bulletins have presented the results of job analyses, while some 23 issues of a publication entitled Research Notes have reported preliminary results or results of minor research studies. Each of the Psychological Research Units publishes its own Research Bulletin series and distributes these throughout the psychological program, while the Office of the Air Surgeon publishes a series of Aviation Psychology Abstracts which describe psychological activities in other agencies in this and other countries. In addition to these publications the psychological groups in the AAF Personnel Distribution Command, the School of Aviation Medicine, and in each of the four continental Air Forces prepare the distribute reports of research. Each Unit in the AAF Aviation Psychology Program also prepares a detailed annual report of activities of research findings.

## X. Prospectus

The foregoing discussion should make it evident that the recent activities within this program indicate a shift in emphasis away from the selection of aircrew trainees for success in training to the selection of those who will make good combat officers. Recently permanent psychological units have been established in each of the four continental air forces. One task of these new units will be to obtain criterion data more closely related to combat proficiency so that the Classification Test Battery and experimental tests may be validated against such criteria. Where possible these units will also assist in selecting men for training in such specialized functions as lead crews and pathfinder crews, using

the results of the classification test battery and of further testing. Each of these units will undertake research in a specified area, such as problems of leadership and motivation, aptitudes required for fighter pilot duty, and accident proneness.

In a further attempt to relate the classification test battery to the combat situation, a revision of the battery has been made which will provide a fighter pilot and a bomber pilot stanine in place of the undifferentiated pilot aptitude score. These scores are approximately equivalent in their validity in elementary pilot training, but the weights for the fighter pilot score place greater emphasis upon speed of reaction and coordination, while the weights for the bomber pilot score place greater emphasis upon maturity of judgment, personal background, and intelligence. These modified weights for the two specialties incorporate, in addition to available coefficients from training sources, validity estimates based on qualitative data arising from observations in the combat theaters and interviews with more than 300 officers in immediate supervision of active combat units in the European and Mediterranean Theaters. Since it is possible to change the weights in accordance with these estimates without materially affecting the validity of predictions with respect to training, it is believed that this procedure is a very desirable one. At the same time, and more or less on the basis of the same type of information, weights have now been established for other combat crew specialties and aptitude scores for various types of gunnery training are being assigned. These gunnery stanines will be made available to personnel officers for use in assigning men to the various specialized types of training but no minimum requirements have been established at the present time.

The search for proficiency criteria in training will undoubtedly gain greater impetus as it progresses. Encouraging results have already been obtained by the Psychological Research Project (Pilot) in an exploratory study of an objective scale of flying proficiency, based on the skill with which certain maneuvers are performed at various stages of the training process. Similarly, the phase check and the ground trainer approach to standards of proficiency in navigator, bombardier, and flexible gunnery training are believed to show considerable promise. Once such reliable and valid criteria have been established, a multitude of training problems will become susceptible of investigation and solution.

In short, while it is not proposed to discontinue attempts to improve the validity of the classification battery for the prediction of success in flying training, it is believed that the solution to this problem has been approximated so nearly that much of the emphasis of the program may be shifted to the advanced problems of combat on the one hand, and the basic problems of training and proficiency measurement on the other.

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## PSYCHOLOGY AND THE WAR: NOTES

*Walter V. Bingham Receives Exceptional Civilian Service Award.* WALTER V. BINGHAM, Chief Psychologist, Classification and Replacement Branch, Adjutant General's Office, and Chairman of the Advisory Committee on Classification of Military Personnel since 1940, received the Emblem for Exceptional Civilian Service at a presentation ceremony Oct. 25 in the office of Major General J. A. Ulio, The Adjutant General. General Ulio made the presentation and Colonel George R. Evans, Chief, Classification and Replacement Branch, AGO, read the following citation:

For exceptionally meritorious conduct in the performance of outstanding service. As chief psychologist of The Adjutant General's Office during the early days of the organization of the Personnel Classification and Replacement Branch, his ability to formulate psychological tests which have become standard in the selection of personnel for initial and specific assignments and his keen foresight and knowledge of psychological problems as applied to the military Personnel Classification System, made him an invaluable aid. The thorough and efficient manner in which he performed his duties gained recognition throughout the entire War Department and the Army, and is reflected in the establishment and acceptance of the Army General Classification Tests and Aptitude Tests as a standard military personnel procedure. He has made a substantial contribution to the military service in time of national emergency.

This highest civilian award conferred by the War Department is recognition of the outstanding service rendered by Dr. Bingham for his work in developing and organizing the personnel system of the Army. Dr. Bingham's interest in this matter has continued since the World War, when he was a lieutenant colonel in the Personnel Branch of the General Staff, and did pioneer work in developing a personnel program for the Army. He was largely responsible for writing the *Personnel System of the United States Army*, published in 1919, which has been of invaluable service in the present war.

*George A. Works to Succeed Leonard Carmichael as Director of the National Roster.* The appointment of GEORGE A. WORKS, of the University of Chicago, to succeed LEONARD CARMICHAEL as Director of the National Roster of Scientific and Specialized Personnel, was announced Oct. 31 by Paul V. McNutt, Chairman of the War Manpower Commission. Dr. Carmichael will continue as Chairman of the Committee on Scientific Research Personnel and as Consultant to the Roster. In accepting Dr. Carmichael's resignation, Mr. McNutt said he did so in order to permit him to devote more time to his duties as President of Tufts College. Before going to Chicago as Dean of Students and University Examiner, Dr. Works had served as President of the University of Connecticut and on the faculties of Wisconsin, Minnesota, and Cornell.

Dr. Carmichael has been Director of the National Roster since it was created in 1940. The Roster has been responsible for placing more than 50,000 professionally-trained men and women in the Army, Navy, war research and war industry. In addition, the Roster has provided detailed information to the armed forces and Selective Service concerning the qualifications of more than 40,000 of its registrants. The information was used in placing these men and women in positions where their specialized training would be of the most effective service in the war program.

"Dr. Carmichael's work," said Mr. McNutt, "in organizing, developing and maintaining a roster of the nation's scientific and specialized personnel has been of invaluable service to the war program."

J. McV. HUNT, (Ed.). *Personality and the behavior disorders. A handbook based on experimental and clinical research.* New York: Ronald Press, 1944. Pp. v+1242, 2 vols.

Psychologists interested in the abnormal and pathological domain will acclaim this Handbook as evidence of the enormous development of that specialty. A glance at the elaborate coverage of topics with ample bibliographies, at least one running to well over 500 items, reveals a growing concern with deviant persons and their actions. Even though the editor intended that the work should deal with personality and its development as well as with abnormalities the primary emphasis is placed on pathology—a telling evidence of the expansion of the abnormal field.

That this work is important follows at once from the comprehensive manner in which it treats facts, research developments, and theoretical issues. There is warrant, accordingly, for a full indication of its general organization, contents, and authorship. The following chapter-listing by parts may also serve as a reference point for evaluating the enterprise as a whole.

*I. Theories of Personality:* (1) The Structure of Personality (D. W. MacKinnon), (2) Personality in Terms of Associative Learning (E. R. Guthrie), (3) Dynamic Theory of Personality (O. H. Mowrer and C. Kluckhohn).

*II. Cross-Sectional Methods of Assessing Personality:* (4) Subjective Evaluations of Personality (E. S. Jones), (5) Personality Tests (J. B. Maller), (6) Interpretation of Imaginative Productions (R. W. White).

*III. Behavior Dynamics, Experimental Behavior Problems, and Hypnotism:* (7) Clinical Approach to the Dynamics of Behavior (T. M. French), (8) Physiological Effects of Emotional Tension (L. J. Saul), (9) Experimental Analysis of Psychoanalytic Phenomena (R. R. Sears), (10) Level of Aspiration (K. Lewin, T. Dembo, L. Festinger, P. S. Sears), (11) Outline of Frustration Theory (S. Rosenzweig), (12) Conditioned Reflex Method and Experimental Neurosis (H. S. Liddell), (13) Experimental Behavior Disorders in the Rat (F. W. Finger), (14) Experimental Studies of Conflict (N. E. Miller). (15) Hypnotism (A. Jenness).

*IV. Determinants of Personality—Biological and Organic:* (16) Heredity (L. S. Penrose), (17) Constitutional Factors in Personality (W. H. Sheldon), (18) Personality as Affected by Lesions of the Brain (S. Cobb), (19) Physiological Factors in Behavior (N. W. Shock).

*V. Determinants of Personality—Experiential and Sociological:* (20) Infantile Experience in Relation to Personality Development (M. A. Ribble), (21) Childhood Experience in Relation to Personality Development (L. B. Murphy), (22) Adolescent Experience in Relation to Personality and Behavior (P. Blanchard), (23) Cultural Determinants of Personality (G. Bateson), (24) Ecological Factors in Human Behavior (R. E. L. Faris).

*VI. Some Outstanding Patterns of Behavior Disorder:* (25) Behavior Disorders in Childhood (L. Kanner), (26) Delinquent and Criminal Personalities (L. G. Lowrey), (27) Unfit Personalities in the Military Services (A. W. Stearns), (28) The Psychoneuroses (W. Malamud), (29) The Functional Psychoses (N. Cameron), (30) The Concept of Psychopathic Personality (P. W. Preu), (31) Seizure States (W. G. Lennox).

*VII. Some Investigated Correlates of Behavior Disorder:* (32) Psychological Deficit (J. McV. Hunt and C. N. Cofer), (33) Electroencephalography (D. B. Lindsley).

*VIII. Therapy and the Prevention of Behavior Disorders:* (34) Psychiatric Therapy (K. E. Appel), (35) The Prevention of Personality Disorders (G. S. Stevenson).

Of the authors 22 are psychologists, 11 psychiatrists, 3 anthropologists, 2 neurologists, 1 physiologist, and 1 sociologist, though several are listed under two headings, for example, psychology and physiology or psychology and psychiatry.

As the outline indicates, the mass of content makes it impossible to summarize the material treated. It ranges from the extreme of practical child psychology, including suggestions for infant training, through many variations on Freudian themes, important summaries of literature in the style of *Bulletin* articles, standard textbook descriptions of psychiatric materials, summaries of special experimental findings as in the chapters on encephalography, behavior disorders in animals, aspiration level, and conflict, to basic psychological and psychiatric theory. In quality of writing the contributions vary considerably, many indicating a deep understanding and judicious presentation of the subject treated, whereas a few resemble elementary textbook chapters. Another not too pleasing feature of the work as a whole is the excess of repetition. While much of this could not be avoided under the general plan of the work, those who read the chapters consecutively can not escape the impression of overload and overlap.

Since in the preface the editor has offered a detailed statement of his aims in producing this work, a reviewer can do no better than to assay the results in terms of those aims.

In the first place, the editor has not achieved his desire for a Handbook so far as concerns Personality. The inadequate coverage of theory and fact pertaining to normal individuals may perhaps be accounted for by his belief that psychoanalysis has been one of the dominant influences in personality study. This belief, too, is basic to the fact that the aim to include contributions from the various life sciences has resulted mostly in varying statements of the psychoanalytic story.

Next it was the editor's intention to bring together scientific illustrations of the molar or whole character of organisms or persons; yet a large share of the material stresses only their partial character. Of the divergent points of view represented some emphasize psychic powers and principles; others argue for the basic character of nerves and muscles. Not lacking, of course, is the protestation that the part is the whole. Perhaps in this instance the inclusion of an objective field statement of personality would have supplied a corrective.

Again, in the title the editor uses the term Behavior instead of Mental Disorders to avoid implying dualism. Nevertheless we find prominently represented such doctrines as "Consciousness is a function of the brain" (270) and "There are normal psychic influences upon the gastrointestinal tract" (273). The general formula is that "emotions" affect physiological activities. This "psychosomatic" doctrine is vigorously criticized by one of the other contributors (867). Still another author, whose contribution carries the disarming title "Personality as Affected by Lesions of the Brain," asserts with strong conviction that "The brain is the organ of mind" (554), and "Only by accepting psychology as a part of physiology can one make any sense out of it" (575). Undoubtedly this same attitude is responsible for his belief that it is scientific to argue that there is a mind as well as a brain and that this brain-organ stores memories, though in an unknown manner. With very few exceptions the contributors are not really concerned with personality events, but with traditional

personality doctrines. The lead which Cameron (868) ascribes to Adolf Meyer of treating functional psychoses as reactions of an individual to social environment has not been followed by many who work with behavior disorders.

Once more, though the editor intended his work to assemble the major portion of theory, investigative fact, and clinical practice, it is after all a parochial enterprise. It is true that many phases and sub-fields are included, but the general blueprint of the work was borrowed mainly from a psychoanalytic textbook of psychiatry. Hence the limited mention of personality theories and the scarcity of a general naturalistic treatment of behavioral variants. There is even a paucity of discussion concerning numerous items of behavioral disorders, notably those of a perceptual or performative type. When perception, reaction time, and other performance disorders are mentioned, they are treated as deficits in persons suffering from the traditionally named psychoses. Here perhaps is a basis for distinguishing between the holistic philosophy of the work and a factual view concerning maladjustments.

And finally it is unfortunate that the volume does not correspond with the editor's entirely correct conviction that normal and abnormal personalities differ only in degree. Unquestionably, the work as a whole is colored by too sharp a differentiation between the two; especially is this true of the writers with organic or neural predilection. On the other hand, the chapter concerned with the concept of psychopathic personality (30) leaves no doubt how thin is the line separating the normal from the pathological.

The critical reader may conclude that these volumes do not adequately mirror the psychological situation in the abnormal field and that despite their excellent features they do not satisfy the basic Personality Handbook requirements. Nevertheless he cannot escape the conviction that this is a worth-while and useful work.

J. R. KANTOR

*Indiana University*

WINN, RALPH B. *Encyclopedia of child guidance.* New York: The Philosophical Library, 1943. Pp. xvi+456.

This volume, printed in small type, two columns to a page, is the work of 74 listed authors representing a wide variety of backgrounds, professional activities, and geographical locations. The table of contents lists 215 topics, many of which have sub-headings in the text discussions. The topics range from *Ability*, *Acceleration*, *Acceptance*, through *Mooseheart System*, *Motivation*, *Music*, to *Vocational Guidance*, *War Effects*, and *Wishful Thinking*. It is reassuring to the reader that practically all the discussions are signed.

It is this reviewer's judgment that the individual articles represent a generally high quality of concise statement for the obviously restricted space. For a volume which includes so many inter-related and over-lapping topics discussed by different persons, the editor and the contributors have achieved a consistency in point of view beyond one's reasonable expectation.

The publisher's announcement states, "The book deals with all phases of child guidance and its many ramifications in psychiatry, psychology, education, social and clinical work. Designed as a guide for physicians, psychiatrists, and clinicians, social workers and educators, because of its simple and clear presentation, it can be used by the intelligent parent as well.—The librarian and research worker will find it an up-to-date reference book." No one reads all of an encyclopedia; workers in each of the above fields can find in this volume something which they can use.

A librarian or a research worker, expecting an up-to-date reference book, would be at a loss to find five pages devoted to *Dreams* and one reference, which states merely "Freud, S.: Interpretation of Dreams" (127); or, two pages discussing *Masturbation*, followed by the single, simple reference "Freud, S.: Three Contributions to the Theory of Sex" (236). Each of these difficult topics merits more than one reference. Some topics have excellent lists of references. Thirty-five references are given for the four and one-half page article on *Nursery Schools*. Throughout the volume, however, there is no consistency of style in reporting the references, a matter which might have been subject to better editorial control.

An example of unevenness of treatment will be discovered by the reader who looks for a discussion of *Growth*. On page 179 he is referred to *Development*, *Maturation*, and *Organismic Age*. In an excellent discussion of *Development* the reader finds, among other things, the statement, "The present writer thus despairs of a consistent use of such a term as 'maturation'." (107). Neither the editor nor the author of the discussion of *Maturation* appear thus to despair. But after reading several times the article on *Maturation* (236–238), this reviewer still fails to find a consistent use of the term.

The reviewer regards as distinctly unsound the advice given in an unsigned paragraph under the heading *Question-Asking* (347). When a two-year-old child asks why? what? or who?

> It is easier to satisfy his curiosity or interest by reference to the world of fairy tales and familiar mythology, till a certain level of intellectual maturity is reached, than by reference to science. A scientific explanation may be as much out of place for the child as a mythological one is for the educated adult. The young child will not comprehend the physiological truth of birth or death; there may be no other way than to tell him the stork tale or "a long trip" story till a more factual explanation can be given (347).

In answering the questions of a small child what legitimate substitute is there for truth? Why should not simplicity and directness in the answer be in proportion to the simplicity and directness of the question?

The inclusion of the discussion of *Heredity* (184–186) represents an almost inexcusable editorial oversight. The article contains two columns of "evidence" on the influence of heredity that was discredited twenty years ago. The findings of the studies of the Jukes and the Kallikaks should not be offered uncritically in 1943 as evidence of "the inheritance of traits and tendencies toward criminality and degeneracy," or of "the heredity trend with regard to mental and moral defect." This article also contains a table of coefficients of correlation to illustrate "trait resemblances," and fails to indicate the nature of the "traits" which were used in the correlations.

In all probability the book will be of most use to undergraduate students for topical orientation.

HAROLD H. ANDERSON

*University of Illinois*

MENNINGER, KARL. *Love against hate*. New York: Harcourt, Brace and Company, 1942. Pp. ix + 311.

For many years Sigmund Freud stubbornly persisted in making shift without recognizing the autonomy of aggressive impulses in human nature. At one time he conceived of love and hate as but two poles of the libido. At another time he saw in his doctrine of narcissism a way to dispose of Adler's theory of aggression. The frustrated love-impulse was regarded as turning or returning

from a heterosexual or social direction to fixate upon one's self as love-object (ego-libido). Only during the horrors of the First World War did it dawn on Freud that perhaps hate (aggression or hostility) was a second instinctual tendency as strong as, if not stronger than love. Finally came his formal declaration of the actual existence of two separate and antagonistic instincts in human nature: the love-instinct and the death-instinct (Eros and Thanatos). This death-instinct conceived as directed against oneself he called the aggression-instinct when directed against others. The repressant to the love-instinct is now conceived as one's own or others' hostility. Here at last the possibility was given of bringing Adlerian psychology back into the psychoanalytic fold. The detailed elaboration of this new manifesto and much theoretical reconstruction rendered necessary by this belated insight Freud left largely to others. In *Man Against Himself* and in the present volume, *Love Against Hate*, Karl Menninger has taken upon himself in excellent wise just these tasks.

It is the thesis of *Love Against Hate* to show how the aggression-instinct is commonly fostered through frustration of the love-instinct and to indicate measures for counteracting the luxuriant growth of hatred in the world. Frustrated parents frustrate the love-impulses of their children in mostly unconscious ways, thereby making for later frustrated adult men who in turn frustrate their wives and for later frustrated adult women who in turn frustrate their husbands, their children and other women. The very first step towards breaking of this vicious circle of aggression begetting aggression is in becoming aware to ourselves of our aggression of which we are all too often unconscious. This step is the *sine qua non* of gaining the mastery of our hostility either through neutralizing it with the love-energies *i.e.* through eroticizing the aggressive energies or else through a sublimation of hostility *i.e.* through substituting socially sanctioned objects for our aggression.

A chapter apiece is then devoted to work, play, faith and hope as means of absorbing or subduing our aggressive energies. To be valuable in this connection work must not be a neurotic compulsion either in aggressive competition with one's father or in an aggressive rejection of parental hopes but should be rather "a pleasure in itself," a spontaneous self-realization of one's love-impulses. Play provides a wholesome catharsis for impulses either aggressive or erotic which have been denied satisfaction by reality. Faith of the mature type makes one face reality without illusion and without fear but with an inmost conviction that one is consecrating his life to that which he feels to be of transcendent worth not only to himself but for all mankind. Hope, if of the mature type, keeps within the frame of external reality and anticipates immortality in one's progeny. It is this kind of hope for immortality that makes for wanted children and insures their loving care, once they are born.

Reserved for the last chapter is consideration of love, the means *par excellence* in the conquest of hate. Instead of cultivating hostility within our young by frustrating their love-impulse it is a matter of nurturing their erotic energies through an encouragement of love to non-human beings and inanimate things and to fellowman, but chief of all through a fostering of naturalistic i.e. life-affirming attitudes towards the sex-life itself.

Probably that which in this book impresses most the reviewer is the somewhat tardily achieved *rapprochement* of the new psychoanalytic love-therapy with the Pauline gospel of *charitas*, the Adlerian doctrine of *Gemeinschaftsgefühl* and Kerschensteiner's *Sozialpädagogie*.

F. C. SUMNER

*Howard University*

BOND, GUY L., & BOND, EVA. *Teaching the child to read.* New York: Macmillan, 1943. Pp. ix+356.

The clinical psychologist who works with children, often meets the problem of the child who is slow or backward in reading. Few, if any, of the many books which have been written on the teaching of reading, offer such a definite program which utilizes the results of research and recognizes and understands the needs of children as this new book by the Bonds. Although written for the classroom teacher, the mode of presentation is so simple and concise and the sequence is so logical, that it lends itself readily for use as a handbook by the clinician.

*Part I. The Child Goes to School*, depicts the complicated nature of the child's initial adjustment to school, establishes a need for reading, describes the kind of reading skill one wishes to develop, and shows the wide range of ability to be met in any one class.

In three chapters of well-chosen material, *Part II. The Child Gets Ready to Read* stresses the principle that children should not be rushed into reading or pushed ahead too rapidly without foundations. Reading readiness is conceived of as mental, physical, personal, emotional, and educational, and methods of appraisal based upon research are described for each of these phases. An outstanding contribution is an easy-to-interpret tabular presentation of the methods for evaluating reading readiness factors (Table II, 48–54).

The four chapters of *Part III. The Child Begins to Learn How to Read*, are devoted to the theories and methods of teaching reading in the primary grades. All the usual methods of instruction are described in detail. The authors take the view that no one method suffices alone, and that a good teacher will select the best phases of each method to develop her own composite method and will remain alert always to needed modifications for individual pupils. The reader is reminded repeatedly that good instruction is individualized but the evils of group reading can be minimized by the use of standardized appraisal methods for classifying pupils and by careful choice of materials.

*Part IV. The Child Becomes an Independent, Extensive Reader*, contains five chapters on the continuation of reading instruction and appraisal throughout the elementary school period. Attention is directed toward the new types of reading experience which confront the child after mastery of the basic principles: reading for comprehension in content subjects; the interpretation of charts, maps, graphs; the use of reference materials; the enlargement of reading tastes and interests; and finally the continuation of reading as an incidental rather than a specific subject. A useful directory of reading tests for elementary school pupils, tabulated by name, grade level, abilities measured, number of forms, time required to administer, name of publisher, and year of publication is presented.

Selected references through the year 1942 relate to pedagogy, experimental research, tests and measurements, curriculum development, and individual differences, and are oriented from the viewpoint of reading instruction.

This reviewer is of the opinion that the authors have succeeded admirably in contributing a concrete and definite program for teaching the child to read and including, without confusing the reader, many understandings about child nature and child behavior which, though not technically a part of the reading act, must be recognized and directed if the child is to become an able reader. Paradoxically, this concreteness and definiteness of program also provokes the book's chief criticism. In providing what amounts to a step-by-step recipe for teaching reading, it invites abuse or misuse by the non-professional who would attempt

to teach reading without a real understanding of underlying physical, mental, social, and emotional processes.

It would have been helpful if the authors had also included suggestions on methods of meeting the impatience of parents and supervisors who bring pressure for immediate and tangible results, a problem in human relations for both the teacher and clinician.

ELIZABETH MECHEM FULLER

*University of Minnesota*

LAWTON, GEORGE (Ed.). *New goals for old age.* New York: Columbia Univ. Press, 1943. Pp. 201.

A collection of lectures seldom, almost never, makes an easy book to review. The lectures are likely to be divergent in aim and uneven in execution. This book is no exception.

The lectures originally formed part of a course for social workers dealing with the aged. Perhaps this accounts for a strong impression in some chapters that only the indigent (or in one chapter by a psychiatrist, the wealthy) grow old. As is perhaps natural, several chapters are essentially a pep talk on the theme that it isn't too bad to be old. Frankly here I prefer the writings of the belle lettrist from Cicero on down to Santayana.

Lawton's own chapter on the aging of mental abilities is eclectic and quite comprehensive. It is the only chapter making extensive use of factual data. L. K. Frank shows that his view of the way personality develops in our culture can be made to yield new insights on old age. Ollie Randall gives us a sensitive analysis of the problems of the older person in the family.

But even for this chapter and still more for most of the others one echoes what Alice Bryan says in her chapter on bibliotherapy: we must pass beyond the anecdotal stage in formulating principles.

The 14 page bibliography shows that much progress has been made toward a more scientific formulation of gerontology; but this fact is inadequately reflected in the lectures.

HORACE B. ENGLISH

*Ohio State University*

## NOTES AND NEWS

W. H. COWLEY, who recently resigned as president of Hamilton College (Clinton, N. Y.), has been appointed professor of education, Stanford University. He will take over his new duties at the beginning of the Spring quarter.

LEO M. HAUPTMAN, director of secondary education and psychologist for the public schools of La Porte (Ind.), has been appointed registrar and director of student personnel, Kalamazoo (Mich.) College.

PHILIP F. ASHTON, director of guidance and personnel and teacher of psychology and sociology, has returned to Seattle Pacific College as executive vice-president, after having spent one year on the staff of Houghton (N. Y.) College and one at Wheaton (Ill). College.

G. WILSON SHAFFER, dean of the College of Arts and Sciences at the Johns Hopkins University, is visiting professor of psychology at Goucher College during the first term of the present college year.

WILLIAM D. ORBISON, former instructor in psychology, Connecticut College (New London), has been appointed instructor in psychology at the University of Connecticut.

DONALD L. QUINSEY has been promoted from instructor to an associate professor in psychology at the University of Maine (Orono).

SAMUEL B. KUTASH, psychologist, Woodbourne Institution for Defective Delinquents (Woodbourne, N. Y.), has been appointed chief psychologist at the Harlem Valley State Hospital (Wingdale, N. Y.) to take charge of the new psychology department.

ZELMA WHITTENBERG has been appointed assistant professor of education and psychology at Westminster College (New Wilmington, Pa.).

W. E. DANNER has been added to the staff of Oberlin (Ohio) College, as lecturer in psychology.

C. A. MACE, university reader in psychology at Bedford College, University of London, has been appointed to a professorship at the Birbeck College of the University.

HARRY L. HOLLINGWORTH, professor of psychology at Columbia University, has given $51,000 to establish a fellowship at the university in memory of his wife, Leta Stetter Hollingworth, professor of education at Teachers College, who died in 1939. The fellowship will be awarded annually to a woman graduate of the University of Nebraska who "is most likely to emulate the character and career of the late Mrs. Hollingworth."

Owing to an unprecedented demand, due in part to war conditions, the seventh edition of the *Biographical Directory of American Men of Science*, published in March, 1944, was exhausted immediately and many orders could not be filled. A second printing has just appeared and the *Science Press*, Lancaster, Pa., is again taking orders.

*Georgia School of Technology Establishes a Department of Psychology.* The Georgia School of Technology has established a department of psychology which is charged initially with four functions: 1. Developing a program of course offerings in general and applied psychology suitable to supplement the engineering training offered by the School. 2. Planning and carrying on a freshman testing schedule designed to assist in sectioning classes, to provide diagnostic data, and to yield measures predictive of probable success of entering students. 3. Investigating and reporting on a counselling and research program suitable to the School. 4. Participating in the work of the Veterans' Center now being organized on the campus. The appointment of a department head is

pending. In the interim, JAMES F. T. BUGENTAL, recently appointed assistant professor of psychology, is serving as acting head. MARTHA CROWE and MARY VIRGINIA BLOXTON have been appointed psychometrists.

*Social Science Research Council Fellowships and Awards for 1945–46.* In accordance with its purpose of assisting in the development of well-trained research workers, the Social Science Research Council has announced the following offerings of fellowships, grants-in-aid, and demobilization awards for the year 1945–1946: 1. *Pre-Doctoral Field Fellowships.* These fellowships are open to men and women under 30 years of age who, prior to the academic year 1944–1945, will have completed their courses and examinations but not their theses for the Ph.D degree. While programs will be closely correlated with the applicants' Ph.D. theses plan, the aim of these awards is not to aid in finishing theses or the collection of data as such, but rather to give an opportunity for obtaining through field work a realistic basis for the dissertation and subsequent research. Many of the approved programs will call for a year's work in close association with public and private organizations where basic material for research can be observed directly. Appointment will be for not less than 9 or 12 months with the basic stipend $1,800 for a twelve months' period. Applications on blanks secured from the Secretary of the Committee are to be submitted by Feb. 1, 1945. Awards will be announced Apr. 15, 1945. 2. *Post-Doctoral Research Training Fellowships.* These fellowships are open to men and women with the Ph.D. or its equivalent in training and experience and who, ordinarily, are not over 35 years of age. Their purpose is to broaden the research training and equipment of promising young social scientists. Programs of study should provide either for training of an interdisciplinary nature, for advanced training within the applicant's field of specialization or for field work intended to supplement more formal academic training. The basic stipend for twelve months is $1,800 for single Fellows and $2,500 for married Fellows, with supplementary allowances for dependents, and necessary travel expenses. Awards are usually for 12 months, but may be made for any period not exceeding two years. Applications on blanks secured from the Secretary of the Committee are to be submitted by Feb. 1, 1945. Awards will be announced Apr. 15, 1945. 3. *Grants-in-Aid of Research.* These grants are available to mature scholars without reference to age whose capacity for productive research has been demonstrated by published work. Before applying to the Council, the applicant should have canvassed other possibilities for support, especially the institution to which he is attached. The maximum amount ordinarily granted will not exceed $1,000. The closing date for application on forms provided by the Secretary is Jan. 15, 1945, with announcement of the grants on Apr. 1, 1945. 4. *Demobilization Awards.* These awards for the support of either training or research projects will be made only to social scientists of exceptional promise whose careers have been seriously disrupted by service in the armed forces or other services. Since their purpose is to assist the recipients in resuming their professional work with the least delay and as efficiently as possible, appointments may be made at such times and such periods, either continuously or intermittently, as seem most desirable. Eligibility is limited to men and women citizens of the United States or Canada under 36 years of age who have either received the doctoral degree or made outstanding records as advanced graduate students. The amount of the stipend will be determined by the committee in terms of individual needs. In general, the Council will, on its own initiative, seek to discover individuals of the greatest promise. Recommendations of such individuals will be welcomed.